

PMAC Plus

Installation and Operating Manual



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Introduction

About This Manual

This manual is designed to cover all aspects of the use of PMAC software from equipment requirements, installation and commissioning through planning and creating a site database system to downloading and displaying site data.

It is assumed that users of PMAC software are familiar with the Microsoft Windows 95, Windows 98 or Windows NT4 operating system. If this is not the case, we recommend that you consult the User Guide supplied with the Windows operating system as required.

To use this manual, the following sequence is suggested:

1. Refer to Section 1 to identify the minimum and recommended equipment required to run the program.
2. Refer to Section 2 for the software installation procedure.
3. Commission the software, referring to Section 3. This includes installation of the software protection dongle, setting access level passwords, registering sites and configuring communication facilities.
4. Plan your particular system, including the use of a graphical interface, referring to Section 4.
5. Refer to Sections 5, 6 and 7 for information on using the Site Database, downloading site data and viewing the data in graph or table format.
6. To assess the utilisation and performance of the system by viewing available log files, refer to Section 8.
7. Refer to Section 9 for an overview of the Logger Settings Editor.
8. Archiving of old data to release hard disk space is covered in Section 10.
9. Troubleshooting information and a glossary of terms are available in Section 11 and Appendix A respectively.

Conventions

The following typographic symbols and conventions are used in the manual:

MENU TITLES and COMMAND NAMES appear in upper-case letters.

Parameters you replace with your own data appear in Italics. The word in italics indicates the type of parameter required. Manufacturer and trade names are also shown in italics.

Bold text indicates something you should type, a key to be pressed or a Windows 'button' to be clicked. When the key names are joined by the plus sign (+), hold the first key down, press the others, and then release all the keys.

Notes:

1. When entering text, all punctuation and symbols (e.g. comma, colon, slash and backslash) must be typed in exactly as shown. Text may be entered in either upper- or lower-case unless otherwise specified. The Enter, or Return, key is marked in this manual by <Enter>.
2. Key names are not exactly the same on all computer keyboards. For example, some computers have a **PrtSc** key while others have a **Print Screen** key.

About PMAC Plus

The PMAC Plus program has been developed as part of a Pressure Monitoring And Control system, and it is from this that its name is derived. PMAC Plus covers a wide range of applications, from pressure control through to flow and temperature logging and is used in many different industries. A similarly wide range of communication systems are supported, including PSTN, GSM, Paknet and CDPD.

How PMAC Plus Works

All sites fitted with a logger are given a unique Site ID and Site Name and are then registered in the PMAC Plus database. Data from each site is routinely downloaded into the database and is then available for display in graphical form and/or as a list of values within the PMAC Plus program.

Note: PMAC Plus requires each site to have a unique identification number (ID). This ID is used by PMAC Plus to control the access to data; if two loggers are given the same ID then this may result in invalid data. The ID must be 4 numerals in the range 0001 to 9999.

PMAC also maintains log files, which record details of all communications, alarms and user access.

The use of Access Levels and Passwords allows multiple users of varying abilities to use a single copy of PMAC without the risk of the less qualified harming the data or altering the operation of the software.

Note: In windows with menu and tool bars, some functions may not be available to you if you have Normal Operator or Casual Operator access.

Main Features

PMAC Plus features include:

- User definable, map-based operation
- Modular expansion
- Remote communications. The Windows communications driver supports:
 - Pager Interface power controller
 - M1 radio-modems
 - PCMCIA modems
 - Multiple protocols on a single modem
 - X.28 PADs.
 - CDPD
- High-speed graphics, including overlaid graphs and:
 - support for "Drag and Drop"
 - support for OLE embedding in documents, etc.
 - graph annotation facility
 - ability to save views of data to PMG files
 - sum file editor (supports brackets)
 - Data archiving
 - Windows 98 and Windows NT support

1 Hardware and Software Requirements

Computer

The recommended minimum hardware and software requirements are as follows:

Element	Minimum	Recommended
Operating system	Windows 98 Windows 2000 Windows XP Windows NT	Windows 2000
Processor	Pentium 133	Pentium II 233
Hard disk	40 Mb free space	Dependent on number of sites
RAM	64 Mb Windows 98 256 Mb Windows 2000+XP	256 Mb
Display	SVGA (800 x 600)	SVGA (1024 x 768)
Serial ports	2*	2
Parallel ports	1	1
Mouse	Serial Mouse	Bus mouse* PS/2 mouse USB mouse
Floppy disk	1.44 Mb 3.5"	1.44 Mb 3.5"

* Use of a serial mouse allows only 1 modem to be attached to the PC. The use of a bus, PS/2 or USB mouse, which leaves both serial ports available, is strongly recommended for systems using remote communications.

Modem

One or more modems are only required where remote data acquisition and/or pressure control is being performed.

Parameter	Requirement
Communication standard	9600bps full duplex (Recommended 3Com Sportster).
Command set	Hayes 'AT' compatible.
Answer mode	V25 preferably with reverse auto-answer sequence available.
Approval	BABT.
Dialling	Pulse and tone and auto-dial.

Uninterruptable Power Supply (UPS)

A UPS is recommended where control systems are being operated, to maintain a continuous power supply to the PC and modem(s) in the event of a mains power failure.

Printers / Plotters

A printer or plotter is not essential to the operation of PMAC Plus but is recommended. Any plotter/printer may be used provided the appropriate driver is available within Windows.

Windows NT Support

This version of PMAC Plus will work with Windows NT 4.0. It will not work with versions of Windows NT before version 4.0. For use with Windows NT 2000 please contact Technolog Ltd for further information.

Ensure that at least Service Pack 3 is installed on the computer before installing PMAC. Administrator access privileges are required to install PMAC for the first time. These are not required at any point thereafter.

2 Installing PMAC Plus

Note: Prior to installing PMAC Plus, Microsoft Windows 98, NT4, 2000 or XP must be installed on the computer.

Supplied Items

When you receive PMAC Plus the following items should be included:

- This manual
- A software protection device called a dongle. The standard dongle is approximately 6 cm long and with a 25-way D-type connector at each end (one end male, the other end female). It is designed to plug into the PC's parallel (printer) port; a printer can then be connected to the dongle and should operate normally. Alternatively, a PCMCIA dongle is available if required.
- A PMAC Plus setup disk. Virus checks are performed on all disks prior to despatch.

Installation Procedure

Note: Prior to starting the installation of PMAC Plus all other applications, including e-mail programs, should be closed.

To install the software proceed as follows:

1. Insert the first PMAC Plus disk in the disk drive. The PC should automatically run the disc and start the installation process. Follow the step by step instructions on screen. (If it doesn't automatically install: use the install instructions in step 2)
2. On the Windows desktop, click on **Start** to open the PROGRAMS menu and select **Run**. In the **Run** window, type **D:\Setup** or click on **Browse**, select the **D:** drive, select **Setup.exe** and click on **OK**. While the set-up program initialises, a window displays the software version until the **Welcome** installation window opens. Click on **Next**.
3. The **Select Protocol(s)** window is displayed. Select either or both protocol options (E5565 and Technolog GPS Protocol) as appropriate. Click on **Next**.

Note: You must select at least one. The Newlog 4 family (including Autowat 4) use E5565 protocol. Newlog3, Metrolog, Utilog and Autowat use Technolog GPS protocol.

4. The **Select Control Type** window is displayed. Select one of the available as appropriate, or, if no control type is required, select **None**. Click on **Next**.
5. The **Choose Destination Location** window is displayed. Either:
 - click on **Next** to accept the default directory, **C:\PMAC**, or
 - click on **Browse** and select or define the directory you wish to use for the PMAC Plus program and click on **Next**.

Note: It is strongly recommended that the default directory be used.

6. The **Select Program Folder** window is displayed. Either:
 - click on **Next** to accept the default folder, **PMAC**, or
 - click on **Browse** and select or define the folder you wish to use for the PMAC Plus program and click on **Next**.

PMAC Plus will now automatically create the directories, install the files and create the appropriate groups and icons within the Windows START menu. A dialog box confirms that the PMAC Plus files are being copied and prompts for subsequent PMAC Plus disks.

7. When all files have been copied, the **Setup PMAC Database** window is displayed. Either:
 - click on **Next** to accept the default database, **Pmacsite.mdb**, or
 - click on **Browse** and select the database you wish to use.

Note: It is strongly recommended that the default database be used.

Check the **Transfer all Site Information to Database** box to automatically transfer existing data files (normally only appropriate if you are upgrading or re-installing the PMAC Plus software), or clear the box if transfer is not required.

Click on **Next**.

8. A dialog box confirms registration of the Psion Comms system, followed by a window prompting you to either re-start your computer now or re-start later. Choose the required option, follow any appropriate instructions in the window and click on **Next**.

Note: It may be necessary to re-boot the computer at this stage to allow PMAC Plus to be started. If so, you will be prompted by PMAC Plus to carry out a re-boot. If you are not prompted to re-boot but subsequently have difficulty in starting PMAC Plus, re-booting may overcome the difficulty.

3 Commissioning PMAC Plus

Installing the Software Protection Dongle

Note: The dongle is a software protection device and PMAC Plus will not operate without it. If the standard dongle is in use, connected to the printer port, it will not interfere with the printer operation, within either Windows or PMAC Plus.

Parallel Port Dongle

1. With the PC and printer switched off, disconnect the printer cable from the PC.
2. Insert the male end of the dongle (pins) into the PC printer port.
3. Re-connect the printer cable to the free end of the dongle.
4. Switch on the PC and printer.

Note: Occasionally, the dongle may not operate (and enable use of PMAC Plus) when an attached printer is switched Off. If this condition occurs, switch the printer on and attempt to run PMAC Plus again.

PCMCIA Dongle

Note: If Windows NT/2000 is to be used with a PCMCIA dongle, please contact Technolog technical support for assistance.

To use a PCMCIA dongle, the driver software must first be installed as follows:

1. Insert the floppy disk containing the VXDINST.EXE installation program, supplied with the PCMCIA dongle, into drive A or D. The PC should automatically run the disc and start the installation process. Follow the step by step instructions on screen. (If it doesn't automatically install: use the install instructions in step 2)

Note: It is important to ensure compatibility that the disk supplied with the dongle (or a copy of the disk) is used in the following procedure. Do not use disks containing other, similar programs.

2. Select the **Start** button from the Windows desktop and select **Run**.
3. Either type in **A:\VXDINST.EXE - D:\VXDINST.EXE**, or browse and select the file, and select **OK**.
4. Select the destination directory for DK2 VXD; the default directory is the Windows\System directory.
5. You are now prompted to re-start Windows to load the driver. Select **Restart**; Windows re-starts.
6. Insert the dongle into an available PCMCIA slot. Windows will detect that new hardware has been found. Select 'Driver from disk provided by hardware manufacturer' and press **OK**.
7. Select the source of the driver (it is in the root directory of the supplied floppy disk) and press **OK**.
8. The PC Card will now be configured for use, you should hear some beeps informing you that this has happened. To check that it is configured, on the Windows desktop select **Control Panel - System - Device Manager** and **DESkey**.

Running PMAC Plus for the First Time

Either:

- double click on the PMAC icon on the Windows desktop, or
- on the Windows desktop, click on **Start** to open the PROGRAMS menu, select **PMAC** and then select **PMAC** from the PMAC menu.

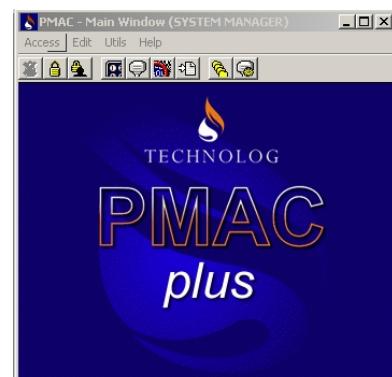
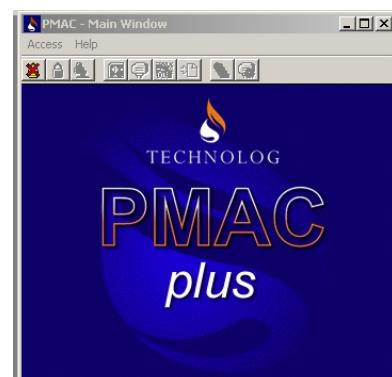
The **About PMAC** window is displayed. Click on **OK** to open the **PMAC Communication Settings** window and the **PMAC Main Window**.

The PMAC Main Window

This window is displayed whenever PMAC Plus is started. Firstly you will have to Log in to be able to use the PMAC Plus software. Select **Access** then **Login**.

Enter your User Name and Password, initially this will be System and System. Though we do recommend that these are changed to ones of your choice (see section PMAC Access Levels and Passwords).

The full PMAC main window will appear after you have logged in. It has a menu bar and tool bar which provides access to the PMAC functions.



*Note: If you intend to use a graphical interface to navigate through the database sites (see **Section 4 Planning the System** below) the opening bitmap image may be displayed in the Main window in place of the default image (right), or it may be accessed from a single active region which is created in the Main window and which provides a link to the opening bitmap image.*

Menu Options

Note: Some menu bar functions may not be available to you if you have Normal Operator or Basic Operator access.

ACCESS MENU

Log Out	Allows the user to log out of the PMAC program ensuring security but also allows PMAC to carry out other functions without closing down.
Edit User Access Levels	Opens a window from which the System Manager can create/edit user

access to the PMAC program.

Exit If you have sufficient clearance, this closes down PMAC Plus after a confirmation prompt.

If you have not got sufficient clearance, a message is displayed and PMAC Plus remains open.

EDIT MENU

Note: The EDIT menu is only available to the system manager.

Directories... Opens the Set Directories dialog which details the current set directories and enables details to be edited as required.

Communication Ports... Opens the PMAC Communication Settings dialog that details the current communications settings and enables changes to be made as required.

Exit Levels... Opens the Exit Levels dialog and enables the system manager to enable or disable exit authority for normal and/or basic operators.

Window Title... Opens the Window Title dialog and enables the system manager to change the title of the current window.

Image > Select - Opens the Select Image File dialog and enables the system manager to change the image displayed in the current window.

Edit - opens the selected image in an appropriate program to enable editing; for example, the Windows Paint program.

Open - opens the selected image in an appropriate program to enable editing; for example, the Windows Paint program.

Active Region Toggles active region editing ON or OFF.

UTILS MENU

Log Report... Enables access to the Alarm, Comms and User logs.

Site Database... Opens the **PMAC Site Database** window.

Local Comms... Opens the **Local Comms** window, enables configuration of local communications (logger, workabout, DTU, disk, etc. as appropriate, depending on system configuration), reading and deletion of data and other associated functions. It also provides access to the **PMAC Communication Settings** window.

Site Info Report... Opens the **PMAC Site Info Reporting** window which displays site reports and enables them to be re-configured, saved, printed, etc.

Archive... This menu option is only available when the system manager is logged on. Opens the **PMAC Archive** window, which enables stored site data to be examined, cleared, prepared for transfer to removable storage media, etc.

Manual Poll... Enables a site or sites to be polled immediately for current data.

Original Size Restores the window to its original size.

Show regions Toggles the display of active regions ON or OFF.

HELP MENU

Installation Info... This menu option is only available when the system manager is logged on.
Displays basic software installation information.

About PMAC... Displays the **About PMAC** window.

Menu Icons



1. Log in

2. Log out

Allows the user to log out of the PMAC program ensuring security but also allows PMAC to carry out other functions without closing down.

3. Setup User Access Levels

Opens a window from which the System Manager can create/edit user access to the PMAC program.

4. Site Database

Opens the **PMAC Site Database** window.

5. Local Communications

Opens the **Local Communications** window, enables configuration of local communications (logger, workabout, DTU, disk, etc. as appropriate, depending on system configuration), reading and deletion of data and other associated functions. It also provides access to the **PMAC Communication Settings** window.

6. Log Report

Enables access to the Alarm, Communications and User logs.

7. Site Info Report

Opens the **PMAC Site Info Reporting** window which displays site reports and enables them to be re-configured, saved, printed, etc.

8. Setup PMAC Directories

Opens the Set Directories dialog which details the current set directories and enables details to be edited as required.

9. Setup Communication Ports

Opens the PMAC Communication Settings dialog that details the current communications settings and enables changes to be made as required.

PMAC Access Levels and Passwords

Access to PMAC Plus has now changed from earlier versions. There were three separate access levels previously with just a single password for each level. For a small company this may be a good solution but for larger organisations with multi-users this would become unsuitable for security reasons.

PMAC Plus now offers the facility for each user to have their own login name and an individual password with a preset access level. As before there will be three access levels. Basic operator, normal operator and system manager, each with appropriate permissions to view data, loggers and settings or to modify logger or program settings.

The access levels are effective throughout PMAC. Switching to a particular level will change the operation of the whole of the system as some tasks or operations require specific access levels (defined by the system manager). If PMAC is in either Normal or System access then the access level will be displayed in the title bar of all windows in the PMAC system. If the user has basic access then no title will be displayed

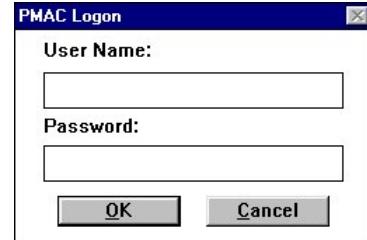
The system manager can change any password using the options in the ACCESS – EDIT USERS ACCESS LEVEL window.

When you have finished working on the PMAC Plus software it is recommended that you leave the system by selecting ACCESS – LOG OFF.

Note: If the PMAC Plus screensaver is enabled, it returns the program to basic operator mode whenever it activates.

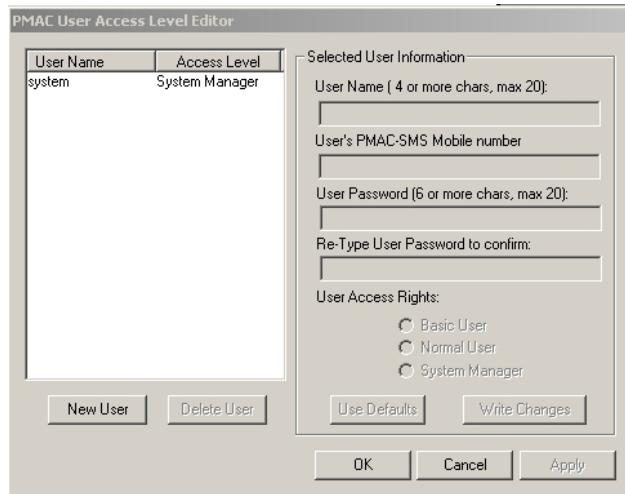
Entering a User Name and Password

From the **PMAC Main Window** menu bar, select ACCESS and LOG IN. From here for the first entry onto PMAC Plus will have to be as system manager so as to set up the passwords for other users of the system. The default user name and password for the initial installation are “**system**”. Type this into both the user name and password field and click **OK**. When logged on correctly, the title of the **PMAC Main Window** changes to include either (SYSTEM MANAGER) or (NORMAL) as appropriate.



Creating/Changing a User Name/Password

After logging in as system manager, select ACCESS – EDIT USER PASSWORD LEVELS. This should bring up the following window.



Add New Users

To add new users follow the procedure below: -

- Firstly click on the NEW USER button on the PMAC USER ACCESS LEVEL EDITOR.
- This will activate the setting on the right hand side of the screen.
- Enter in the new user name into the USER NAME field. This must be at least 4 characters in length with a maximum of 20.
- Enter the PMAC – SMS Mobile Number.
- Move down to the USER PASSWORD and enter in the new password to be used by the user. Ensure that the password is more than 6 characters in length and no larger than 20 characters.
- Re-enter the password again into the RE-TYPE USER PASSWORD TO CONFIRM field.
- The next stage is to set the access rights for the new user. To do this, select one of the three choices.
- When complete click on the WRITE CHANGES button.

Edit a User's Details

A user may require changes' from time to time depending on what level of access is required or maybe just to change their password for security reasons. Whatever the case to edit the users details follow the procedure below.

- From the PMAC USER ACCESS LEVEL EDITOR window highlight the user name to be edited.
- From here the user can select the required field to be edited.
- When all changes are complete click the WRITE CHANGES button.

Removing Users

To remove users follow the procedure below: -

- From the PMAC USER ACCESS LEVEL EDITOR window highlight the user name to be removed.
- When highlighted click the DELETE USER button.
- The ARE YOU SURE window will then appear for a second confirmation. If the user is sure then click YES otherwise click NO.

Note: There must always be one system manager. PMAC Plus will not allow the removal of the last system manager.

Setting up the PMAC Directories

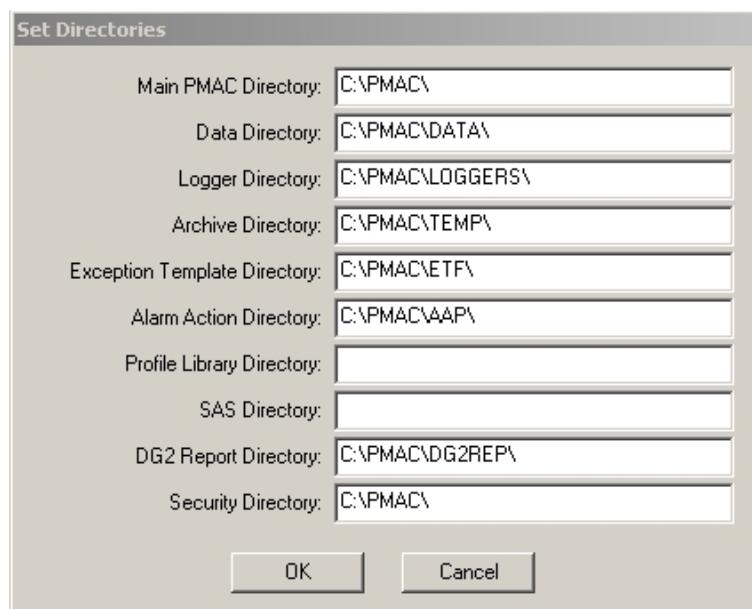
The **PMAC Directories** option is used to allow you to select the path where you would like each of your directories to be gathered from.

The PMAC Directories are accessed through the EDIT - Directories menu option in the **PMAC** window, or by clicking directly on the PMAC Directory menu icon in the main menu toolbar .

The **Directories** window (right) will appear provide access to all of the Directories functions.

Select the directory you wish to set up and enter the correct path to which you would like the directory to look.

Once all the required fields are filled select **OK**.



Registering Sites on the Database

Identifying Sites

Each site, which is to be monitored by the PMAC Plus database, must first be allocated a unique PMAC Plus Site ID number and Site Name. The Site ID must be the same as the ID number programmed into the logger which is in use on that site (i.e. the logger connected to Site 0002 must be configured as Logger 0002). The site must then be registered in the database.

The Site ID numbers form the software's key to accessing sites. For sites using local communication (no direct telephone connection), PMAC reads the logger ID whenever data is available for downloading and assigns the data to the correct site.

If a site or logger ID number is incorrect or duplicated, then PMAC Plus may refuse to accept data, or assign the data to the wrong site.

Creating Sites

Refer to Section 5 Using the Site Database - Creating a New Site, below.

Configuring Communications

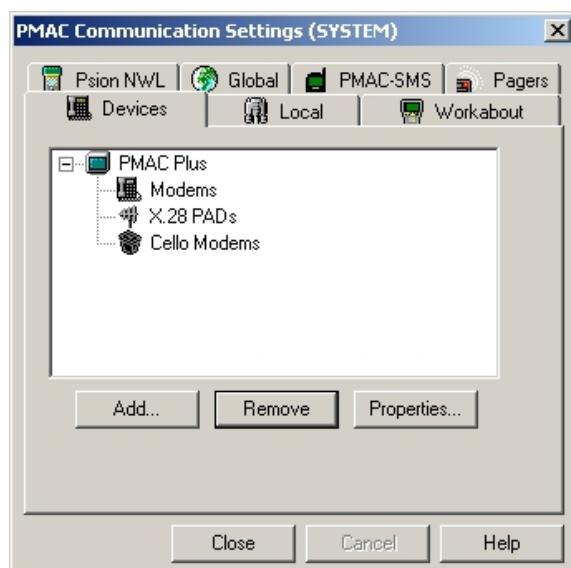
Communications Driver

Features include:

- communications over multiple devices at the same time: PSTN (Land Line), CSDN (Telex), Radio Packet Network (e.g. Paknet), Cell phone Network and CDPD.
- support of Multiple Modems or PADs (Packet Assembler / Disassemblers); allows you to set these devices to dial or wait for alarms as needed.
- support of the use of single modems at multiple speeds for dial-out.

Setting up the Driver

When PMAC Plus is first run, the **PMAC Communication Settings** window is displayed. This window can also be accessed at any time when at system manager level by selecting EDIT and COMMUNICATIONS PORTS from the **PMAC Main Window** menu bar. The window enables the setting up of modems, X.28 PADs and the local port can be set up.

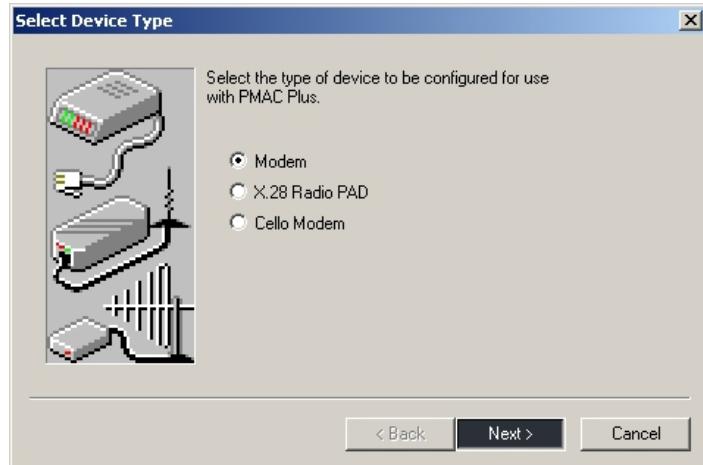


Setting up a Modem

1. Click on the **Devices** tab in the **PMAC Communication Settings** window (above).

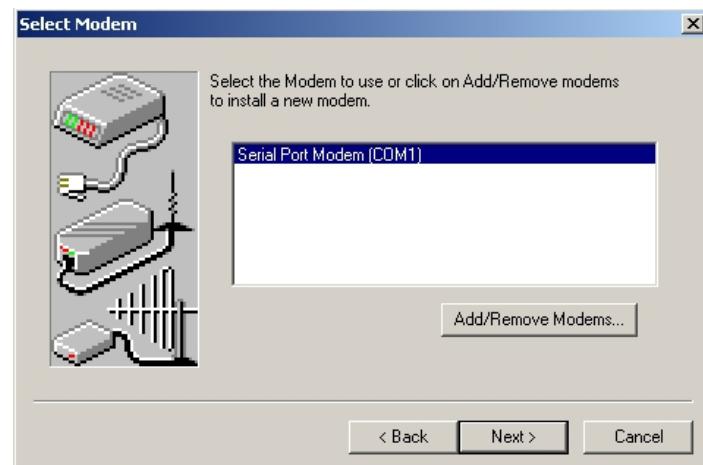
Select **Modems** and click on **Add**. The **Select Device Type** window (right) is displayed.

Select the **Modem** radio button and click on **Next**.



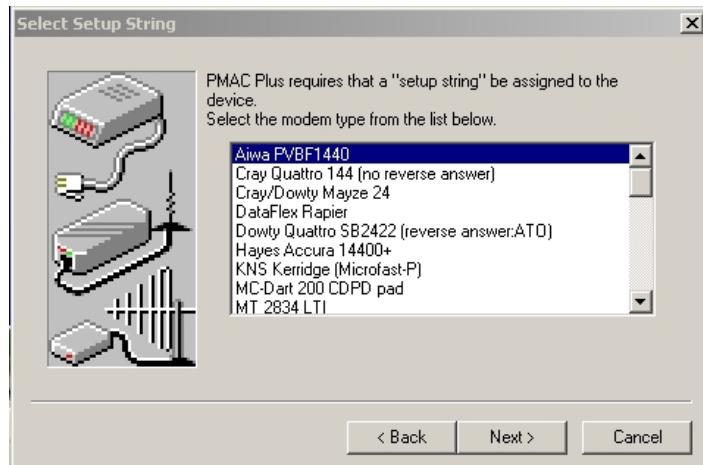
2. The **Select Modem** window (right) is displayed.

Select the required modem and click on **Next**.



3. The **Select Setup String** window (right) is displayed.

Select the modem type from the list and click on **Next**.



4. The **Select Dial Modes** window (right) is displayed.

Select either or both options as appropriate and click on **Next**.



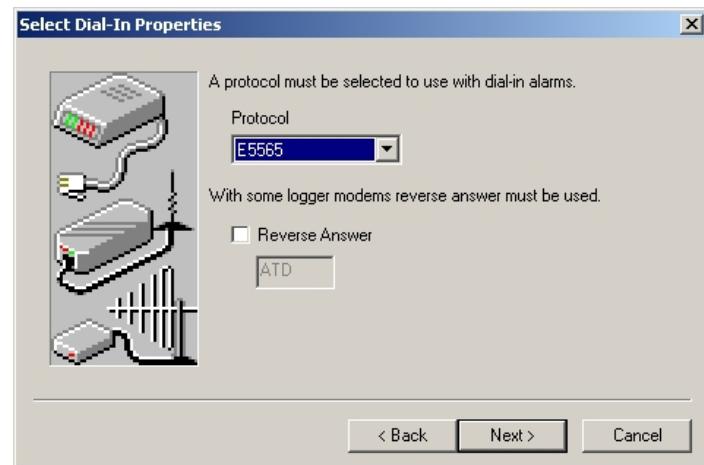
5. If Dial-In was enabled in step 3, the **Select Dial-In Properties** window (right) is displayed.

Select the required protocol - a protocol MUST be selected.

If required, select the **Reverse Answer** box.

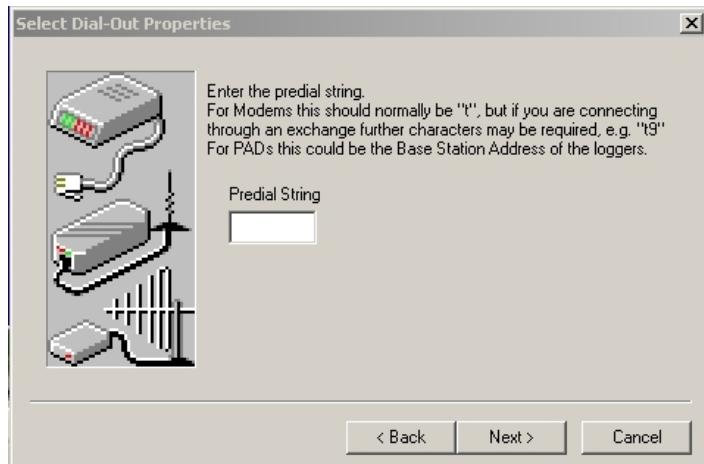
Note: Reverse answer is usually only used with E5565 protocol loggers. It is a downward compatibility feature for use with some loggers sourced from different manufacturers. This feature is rarely required and it is recommended that it be left disabled.

Click on **Next**.



6. If Dial-Out was enabled in step 3, the **Select Dial-Out Properties** window (right) is displayed.

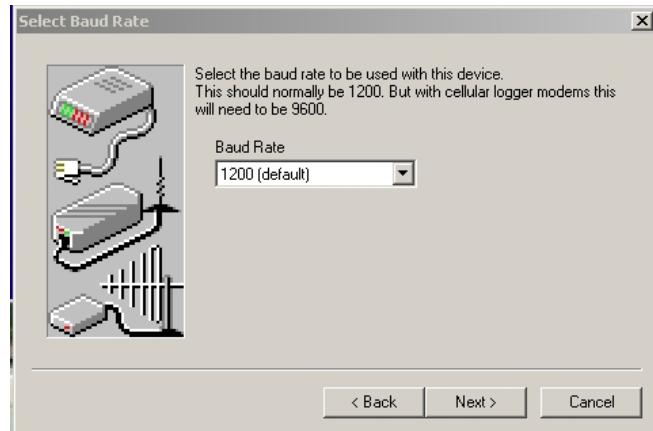
Enter the required Predial String and click on **Next**.



7. The **Select Baud Rate** window (right) is displayed.

Select the required Baud Rate. Set baud rate to 1200 (default) unless the modem is to be used with M1 systems, in which case it may be necessary to increase the baud rate to 9600.

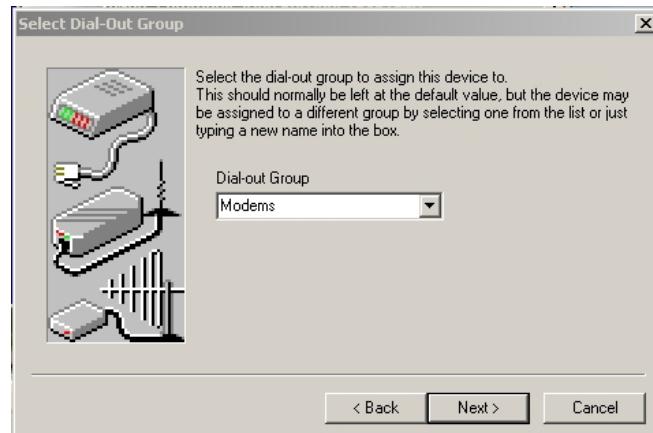
Click on **Next**.



8. The **Select Dial-Out Group** window (right) is displayed.

Select the required group – refer to the note below. This should normally be left at the default **Modems** setting, but if required, either a different group can be selected from the list or a new group name can be entered.

Click on **Next**.



Note: **Dial-out Group** allows modems (or X.28 PADs) to be grouped so that sites can be selected to use different modems, or X.28 PADs, or groups of modems/X.28 PADs.

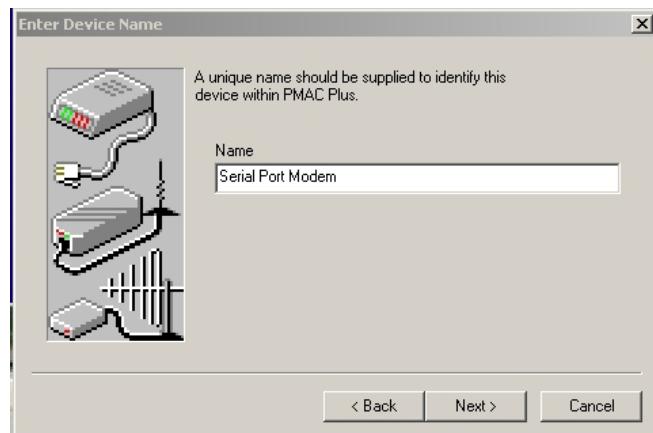
There are two default groups, **Modems** and **X.28 PADs**. When a modem or PAD is first installed, you can either put in one of these two groups or choose your own group name.

A different group can be selected from the drop down list or a new group name just typed into the box.

To enable a site to use a particular dial-out group, access the site in the Site Database and select the appropriate group.

9. The **Enter Device Name** window (right) is displayed.

Enter an appropriate, unique name for the device and click on **Next**.



10. The **Add Communication Device** window (right) is displayed.

Click on **Finish** to add the modem.

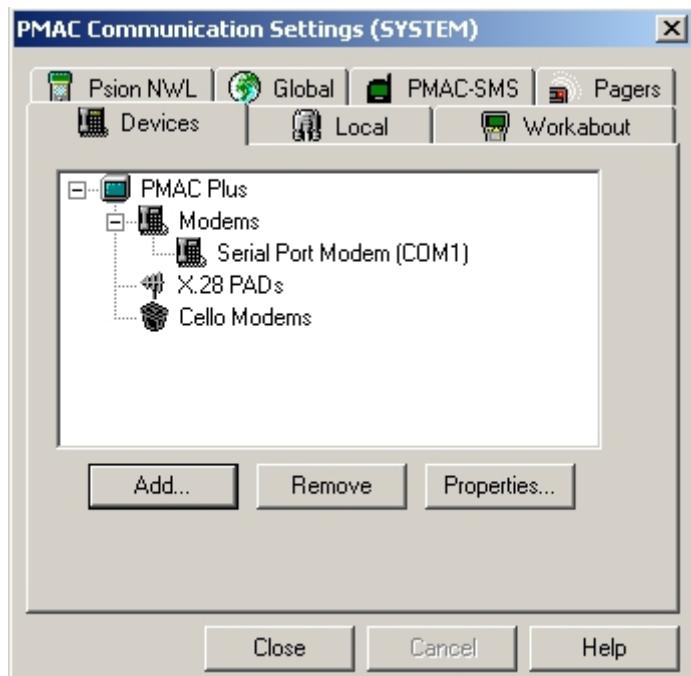


11. When the modem is installed, the **PMAC Communication Settings** window (right) displays the installed modem(s).

The three possible icons used in the modem page tabs are:

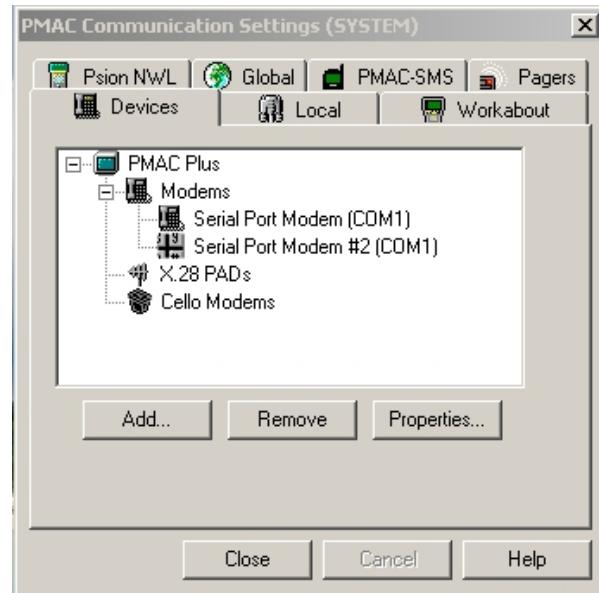


There is no icon for **not dial in/out**, because if no comms are possible on a device, it is not displayed in the dialog at all.



Adding a Second Modem

To add a second modem, repeat the procedure detailed above in **Setting Up a Modem**. The second modem will now also be displayed in the **PMAC Communication Settings** window (right).

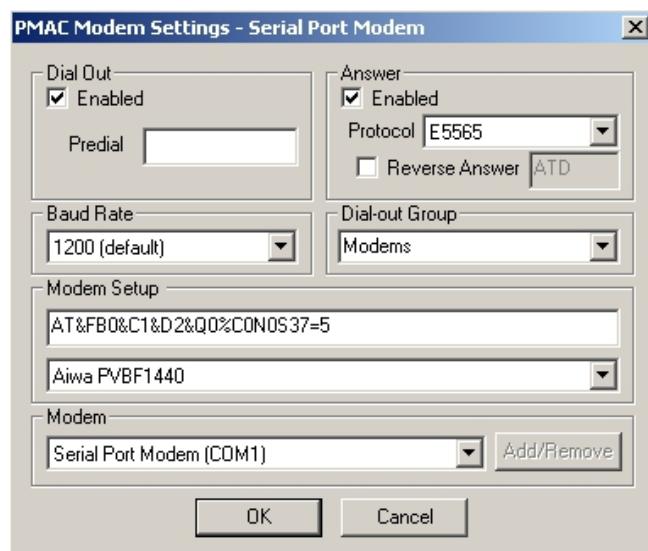


Re-Configuring an Installed Modem

To re-configure a modem in PMAC Plus, open the **PMAC Communication Settings** window and either double-click on the modem or select it and click **Properties**. The **PMAC Modem Settings** window (below right) is displayed.

Select the modem type from the **Modem** drop down list and the modem setup string will be placed in the Modem Setup box.

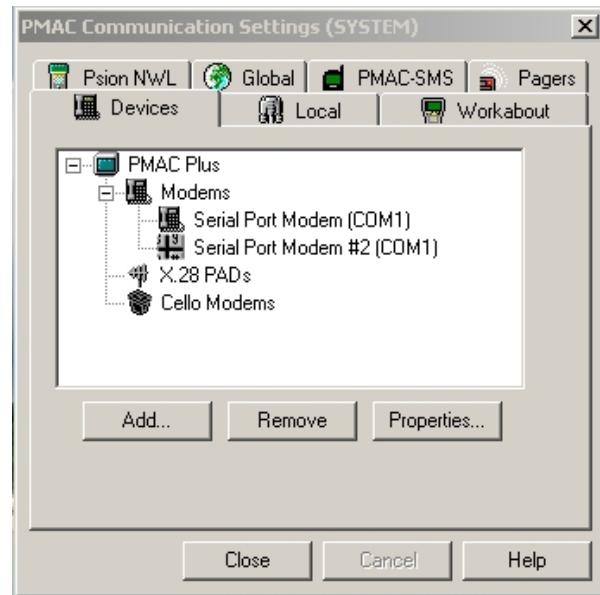
Refer to **Setting Up a Modem**, earlier in this section and make any required changes to the displayed settings for the modem. Click **OK** to save the changes.



Configuring One Modem to Work at Two Baud Rates

This is a useful feature if only one modem is available but the various types of in-use loggers require communication at different baud rates (e.g. Utilogs and M1 systems)

It is necessary to set up the same modem twice on the same comms port using the **Modem Properties** dialog. Two modems will then appear in the **PMAC Communication Settings** window. These should be set up in different dial-out groups and then individual sites can be set up in the Site Database to access the correct dial-out group.

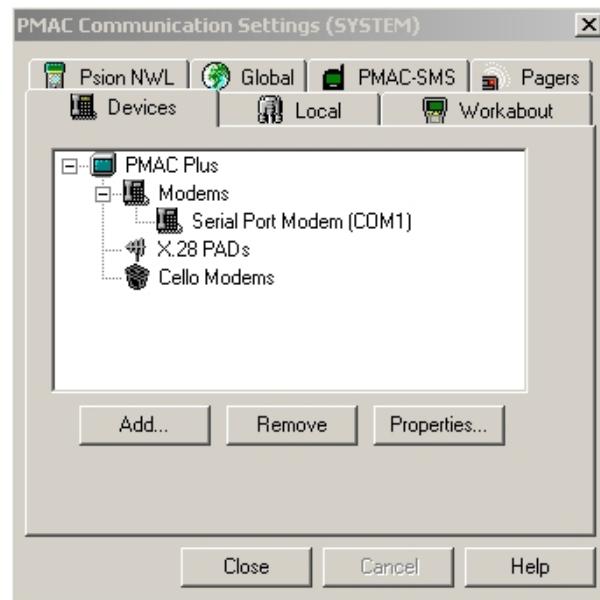


Setting Up X.28 Pads

The procedure required to set up X.28 pads is similar to that for setting up a modem (refer to **Setting Up a Modem**, earlier in this section).

1. Click on the **Devices** tab in the **PMAC Communication Settings** window (right).

Select **X.28 PADs** and click on **Add**.



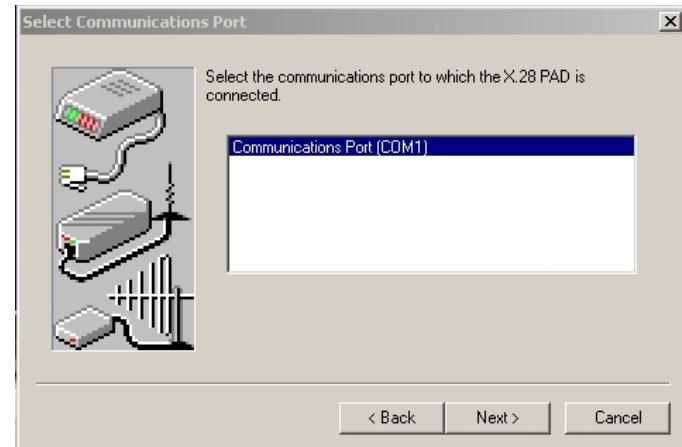
2. The **Select Device Type** window (right) is displayed.

Select the **X.28 PAD** radio button and click on **Next**.



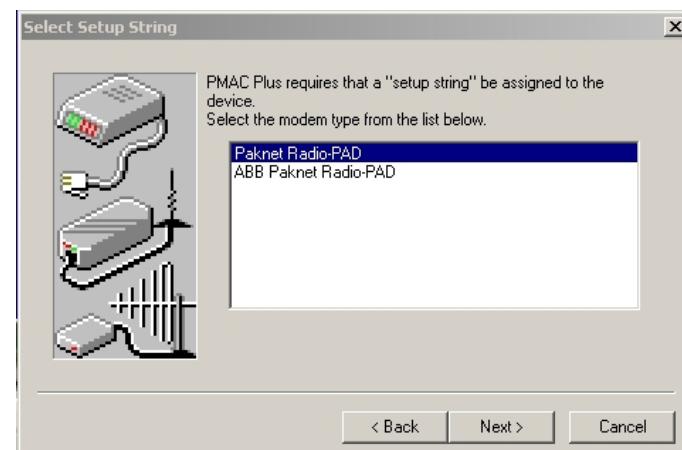
3. The **Select Communications Port** window (right) is displayed.

Select the appropriate port and click on **Next**.



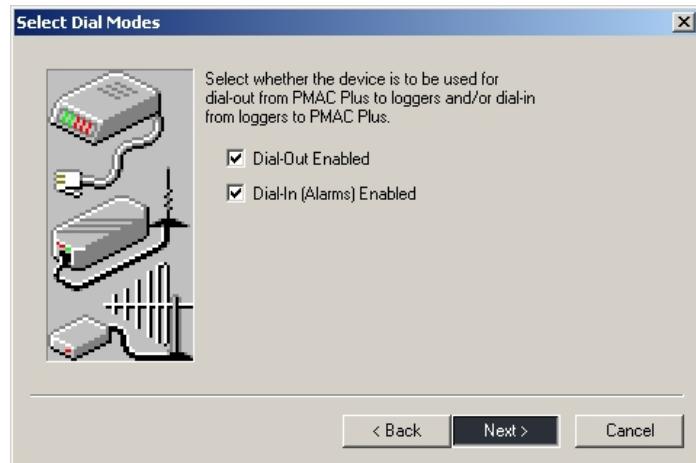
4. The **Select Setup String** window (right) is displayed.

Select the PAD type from the list and click on **Next**.



5. The **Select Dial Modes** window (right) is displayed.

Select either or both options as appropriate and click on **Next**.



6. If Dial-In was enabled in step 5, the **Select Dial-In Properties** window (right) is displayed.

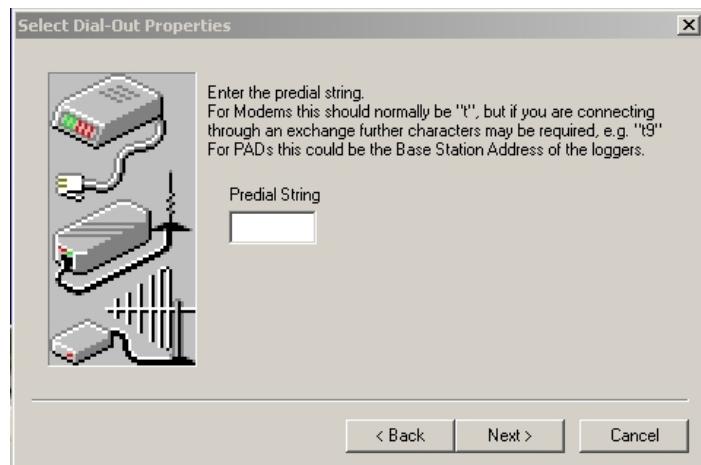
Select the required protocol - a protocol **MUST** be selected.

Click on **Next**.



7. If Dial-Out was enabled in step 5, the **Select Dial-Out Properties** window (right) is displayed.

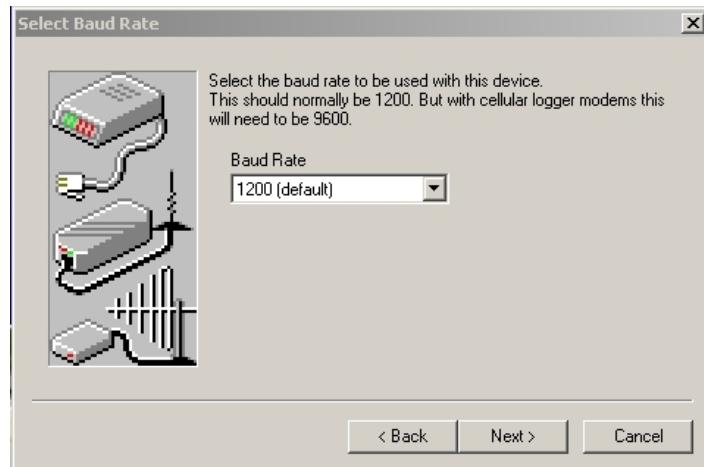
Enter the required Predial String and click on **Next**.



8. The **Select Baud Rate** window (right) is displayed.

Select the required Baud Rate. This should normally be left at the default 1200 baud rate.

Click on **Next**.



9. The **Select Dial-Out Group** window (right) is displayed.

Select the required group – refer to the note below. This should normally be left at the default **X.28 PADs** setting, but if required, either a different group can be selected from the list or a new group name can be entered.

Click on **Next**.



Note: *Dial-out Group* allows X.28 PADs (or modems) to be grouped so that sites can be selected to use different X.28 PADs, or modems, or groups of modems/X.28 PADs.

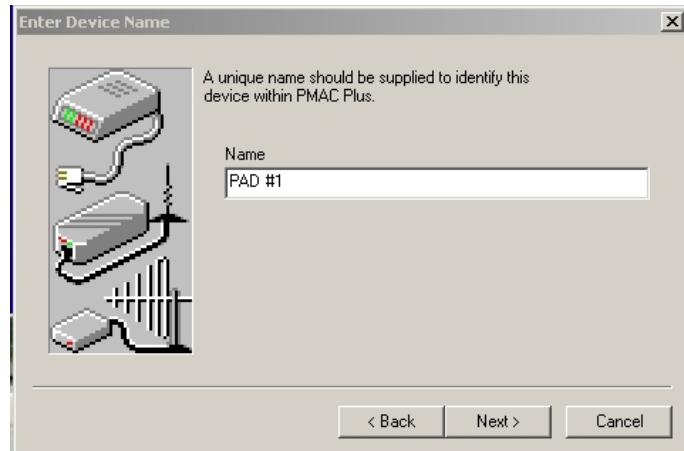
There are two default groups, Modems and X.28 PADs. When a modem or PAD is first installed, you can either put in one of these two groups or choose your own group name.

A different group can be selected from the drop down list or a new group name just typed into the box.

To enable a site to use a particular dial-out group, access the site in the Site Database and select the appropriate group.

10. The **Enter Device Name** window (right) is displayed.

Enter an appropriate, unique name for the device and click on **Next**.



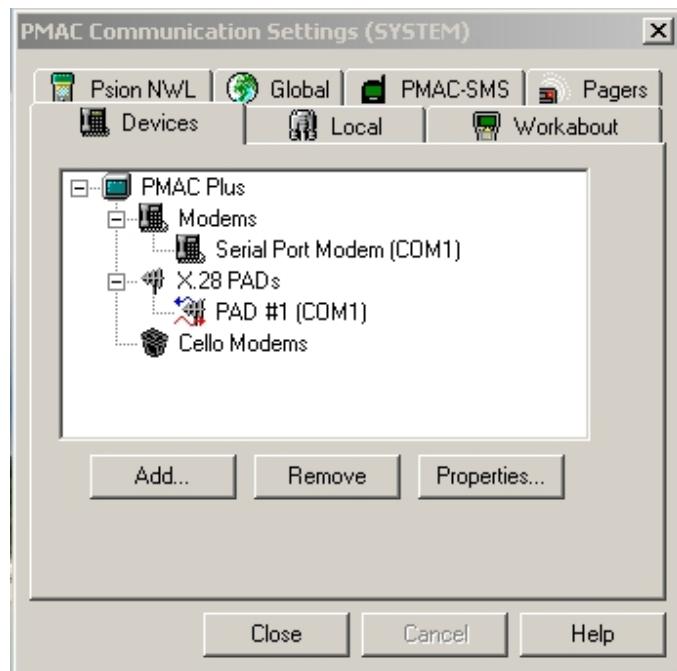
11. The **Add Communication Device** window (right) is displayed.

Click on **Finish** to add the PAD.



12. When the PAD is installed, the **PMAC Communication Settings (SYSTEM)** window (right) displays the installed PAD.

The three possible icons used in the X.28 page tabs are:



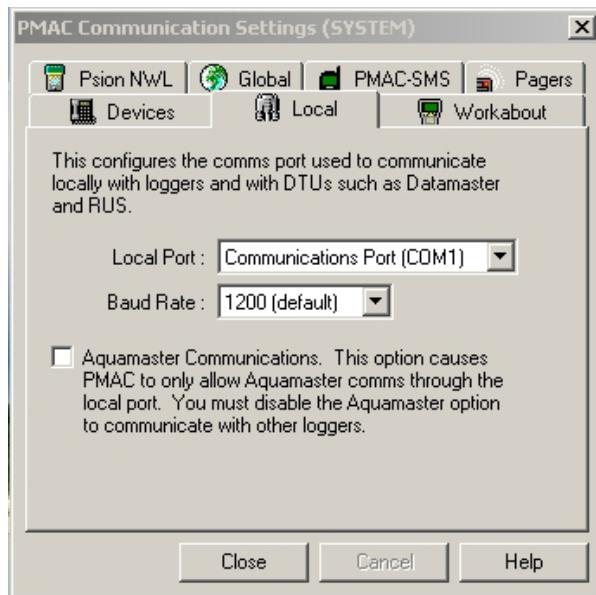
Adding a Second X.28 PAD

To add a second, or subsequent PAD, repeat the procedure detailed above in **Setting Up X.28 PADs**. The added PAD(s) will now also be displayed in the **PMAC Communication Settings** window.

Setting Up the Local Port

The local port is used for transferring data from sites, which are not directly connected by telephone. The Logger or a data retrieval unit such as a Psion II, Psion Workabout or Datamaster Transfer Unit connects to the port.

1. Click on the **Local** tab in the **PMAC Communication Settings** window to show the **Local** port settings.
2. Select the appropriate local port.
3. Leave the Baud Rate at the default 1200 setting.



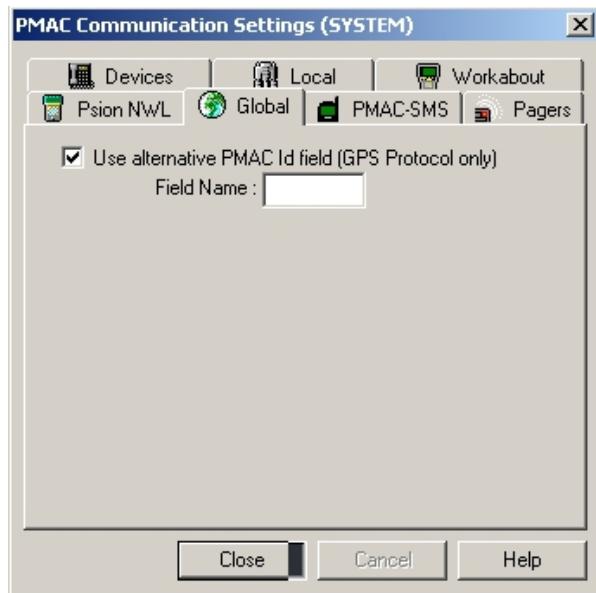
Setting Up Global Options

Click on the **Global** tab in the **PMAC Communication Settings** window to show the **Global** settings.

In most cases the two options will both be disabled.

ALTERNATIVE PMAC ID FIELD

Should an alternate field be used to store the PMAC ID in GPS protocol loggers then check that option and insert the name of the field.



Setting Up a Workabout

This configures a local port for communication with a directly connected Workabout.

1. Click on the **Workabout** tab in the **PMAC Communication Settings** window to show the **Workabout** port settings.
2. Select the appropriate local port.

If the Workabout is to be connected to the PC on COM1 or COM2 then the setting can be left at Auto. Otherwise select one of the other settings. Using the "None" option will disable Workabout Comms.

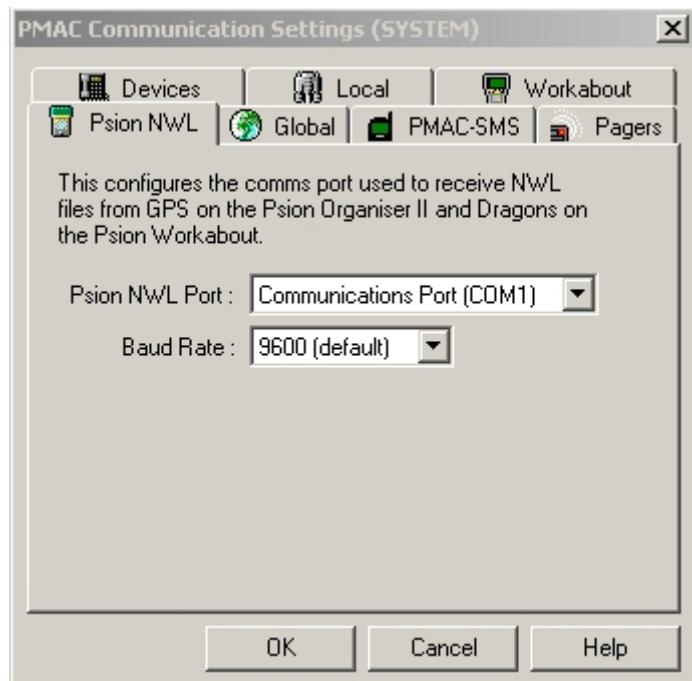


Note: If there are problems with using the Auto setting, try selecting the specific port.

Setting Up a Psion NWL

This configures a local port for communication with a directly connected Psion Organiser II running GPS or a Workabout running Dragons. It also allows configuration files to be sent to a Psion Organiser II.

1. Click on the **Psion NWL** tab in the **PMAC Communication Settings** window to show the **Psion NWL** port settings.
2. Select the appropriate local port.
3. Set the Baud Rate to the same value as that set in GPS or Dragons.



Setting Up a Pager

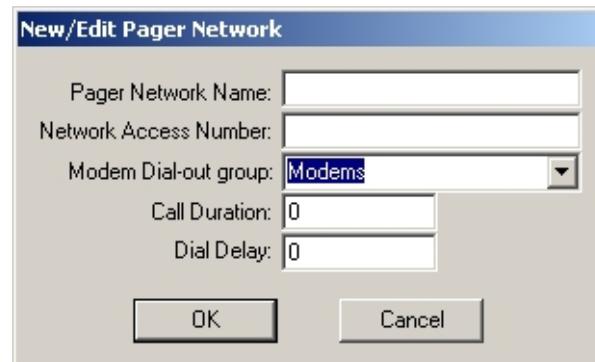
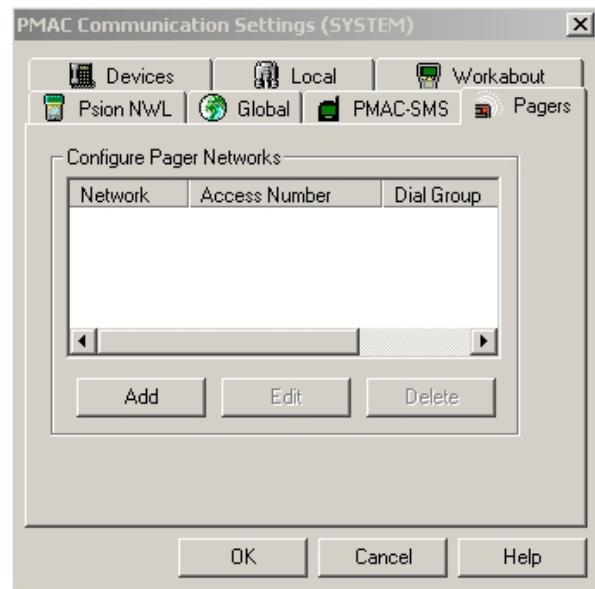
Pager pre-dial is used with logger systems which have a pager attached to switch on the power to a modem or X.28 PAD ready for comms.

Click on the pre selected pager to be edited or select **Add** to enter a new pager pager.

Enter the Pager Network Name, and the Network Access Number, then Select an appropriate dial-out group to use.

If a Modem dial-out group is selected then the **Call duration** box should be filled. The **Call Duration** is the amount of time, which the modem will stay connected to the paging service. Setting this too long will slow down the call process, but setting it too short may mean that the pager request is not accepted.

The **Dial Delay** is the amount of time, which PMAC Plus will wait after the **Call Duration** time has elapsed before it starts to call the logger. This is to allow time for the paging request to get to the logger and the communications to be powered up. If this is too long the logger modem or X.28 PAD may power down before the call is received and if it is too short the modem or X.28 PAD may not be ready to accept the call.



Note: If an X.28 PAD dial-out group is selected the available options change. The Destination NUA is the NUA or PAD number of the pager service. The Dial Delay works the same as for modems. There is no Call Duration for X.28 PAD dial-out groups.

To enable a site to use pager pre-dial, access the site in the Site Database, select **Call Pager** and enter the Pager Number.

Note: Do not include spaces if using X.28 PAD group. The only exception to the rule is if any extra information is required for an X.28 pager. In this case a space then the extra information can follow the number

When finished setting all options click on **OK** and the new settings will be immediately implemented. There is no need to restart PMAC Plus.

Setting the PMAC - SMS Modem

Select the communications port that the PMAC – SMS modem is connected to and enter the modem's own number.

Selecting **Active Security** will only allow the users that have been allocated within the User Access Levels to use this modem.

Note: No other communications will be possible with this modem



Using the Driver

The new comms handler adds a Technolog PMAC icon in the Windows desktop task bar to show that it is running.

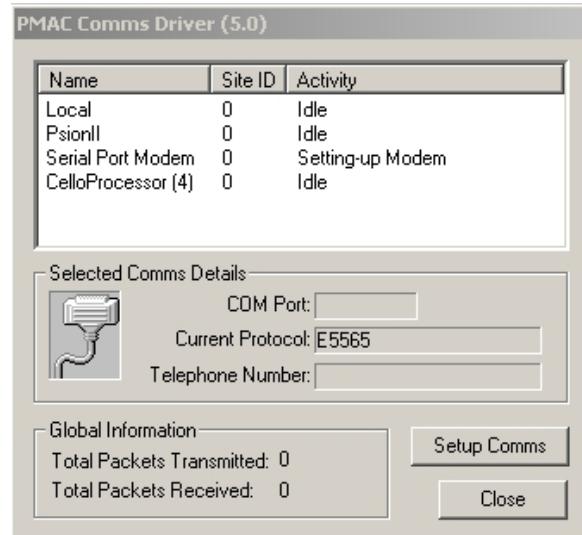


Left clicking on the icon brings up a small menu allowing you to view the **About** box, or the **PMAC Communications Driver Properties** window (right). A double click on the icon will also open the **PMAC Communications Driver Properties** window. This displays the current state of communications activities.

In this example, there are three available options: Local communications, a serial port modem and a Psion NWL. You can see the individual activity of the devices, and the PMAC ID of the current sites they are working on. The display can be scrolled if there are too many modems to show on one page. To view the com port, protocol or telephone number for the appropriate communication device then select the device from the name column of the table.

The lower section of the page shows the overall communication statistics with the global number of packets transmitted and global number of packets received.

Click on **Set-up Comms** to open the **PMAC Communication Settings** window and make any required changes.



Setting Program Exit Levels

Because PMAC Plus can be used to continuously monitor alarms from loggers and control systems, there is a facility to disable the closing of PMAC Plus. By default, only the system manager can close PMAC Plus. To allow other user levels to quit the program, the system manager must select EDIT and EXIT LEVELS from the **PMAC Main Window** and select the user levels requiring closure authority.

4 Planning the System

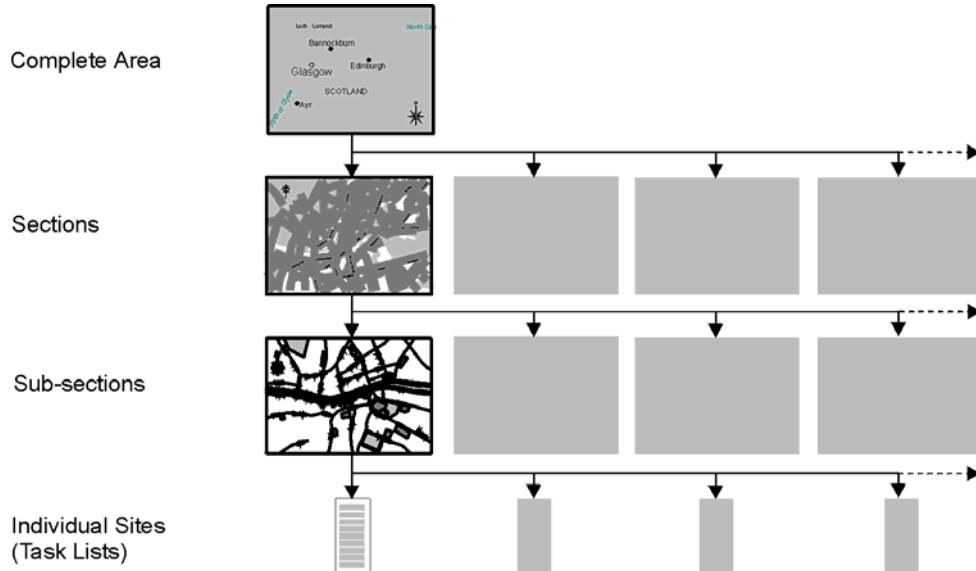
Initial Considerations

The installation of PMAC Plus and configuration of communications is only the first step in the commissioning process. The program structure must be planned and site names, site identification numbers and any required images created. Be aware that sometimes a chosen method may not be as effective as anticipated - so do not be afraid to try a relatively simple system initially and refine it later as your experience grows.

The first requirement is to decide how you are going to access your sites. There are two available methods, as follows:

1. By opening the **Site Database** window from a PMAC window menu (UTILS - SITE DATABASE) or just selecting the **Site Database icon** from the PMAC window menu, and selecting or entering either a Site ID number or Site Name. This is the most straightforward, and the most commonly used method of using PMAC Plus.
2. By using a graphical interface (see simple example below). This involves the use of a hierarchical structure as follows:
 - A main image, showing the whole area of the system, is divided into geographical regions which are made into **Active Regions** - see **Active Regions** later in this section.
 - Each **Active Region** is **linked** to a larger scale image showing the particular geographical region in greater detail.
 - Each geographical region can be further divided into smaller geographical sub-regions, which are again made into Active Regions.
 - Again, each Active Region is linked to a larger scale image showing the particular geographical sub-region in greater detail.
 - After a suitable number of levels, dependant on site complexity and user preference, the Active Regions in the most detailed image provide access to the individual sites shown on that image. These give access to **Task Lists** (pop-up menus) which enable access to the more commonly used site functions.

To access the graphical interface, either the PMAC Main window image can be replaced with the top level image, or an area of the normal image in the PMAC Main window can be made into an Active Region which is linked to the top level image.



In active region editing mode, left clicking on active area displays a pop-up editing menu and right clicking opens the linked, more detailed image window. Left clicking on a site active region displays a pop-up editing menu complete with any set task list entries.

With active region editing disabled, left clicking on an active area opens the linked, more detailed image. Left clicking on a site active region displays the task list for that site.

Notes:

1. Active regions that are linked to a site are referred to as *task lists*.
2. Active regions relate to the **WINDOW** in which they are generated and **NOT** to the **IMAGE** within the window. Hence, if the image is changed, the active regions remain in the same locations within the window.

If you plan to use a graphical interface, see below for details of the creation of suitable images and their configuration and modification to form a structured navigation system within the database.

Creating a Graphical Interface

Creating Bitmaps

PMAC Plus can handle a range of image types, dependent upon the software installed on a PC. The most commonly used format is Windows Bitmap (BMP). BMP files can be created and edited using the Windows Paint program. Images may be generated by various methods including manual creation or mono/colour scanning.

Details on the creation of images are not provided in this manual although Technolog provide a service for creating images from existing paper drawings.

Changing the Main Window Image

When using a graphical interface, the default logo and title image displayed in the **PMAC Main Window** may be replaced by the complete area image you have created. Alternatively, an Active Region must be created in the **PMAC Main Window** that is linked to a window containing the complete area image.

To replace the standard window image with the complete area image, run PMAC Plus with system manager access and access the window you wish to display the area image. Select EDIT - SELECT IMAGE from the menu bar; a file selection window opens. Move to the directory where the PMAC Plus image (bitmap) files are stored, select your opening image then click **OK**. The image should fill the window.

Active Regions

Once the images for the system have been created they can be integrated into the required 'tree' type structure.

Images are linked using **Active Regions**, which can only be created or modified when PMAC Plus is switched into a special editing mode.

Active Regions are areas in the PMAC windows, which responds to mouse clicks and allow you to access a task list or zoom to a new window. Active regions 'pop-up' - the borders are highlighted when the mouse pointer is over them. They can also be displayed by using the SHOW REGIONS command in the PMAC window UTILS menu.

ACTIVE REGION EDITING MODE

To enable Active Region Editing:

- Run PMAC Plus with system manager access.
- Select EDIT - ACTIVE REGION from the menu bar.

Initially this may appear to have no effect, however returning to the EDIT menu will show that there is now a tick symbol at the side of ACTIVE REGION indicating that the editing mode is operational. Each time the ACTIVE REGION menu option is selected, the mode toggles between enabled and disabled.

Linking Images Using Active Regions

To create a link between an existing image and a new image proceed as follows:

- Run PMAC Plus with system manager access.
- Enable active region editing – see **Active Region Editing Mode** above.
- With active region editing enabled a new region may be created. On the **PMAC Current Window** image, position the mouse pointer at the top left corner of the region you wish to make active. Click and hold the left mouse button down and drag the mouse pointer to create the box, which will become the active region. When the box is the correct size, release the mouse button.
- Check that the active region has been created correctly by moving the mouse pointer across the area of the box. While the pointer is within the active region, the region should be displayed. If this does not happen, the region may have been created too small, or it may have overlapped another region, which is prohibited.
- Assuming that the region has been created correctly, move the mouse pointer into the region and click the left mouse button; a menu will appear. Select **WINDOW** from the menu.
- Move the mouse pointer into the region again and click the left mouse button again to produce the menu. This time, select **ZOOM IN**; this opens a new, blank window. Note that when making this selection the **WINDOW** option has a tick against it, indicating that this active region has been designated as a link to another image.
- In the new, blank image select **EDIT - SELECT IMAGE** from the menu bar. In the file selection window identify the image you wish to use and click **OK**. The selected image should appear within the new window.
- Select **EDIT - WINDOW TITLE** from the menu bar and enter the name for the new window.

Note: Windows should always be given titles. The title performs two important functions:

1. *When a window is minimised, the name is shown to allow easy access.*
2. *The name is used when transferring active regions around the PMAC Plus structure.*

Restoring Windows to Original Size

The image windows within PMAC Plus can be re-sized as required. However, this can often produce a distorted image or a loss of detail. The **ORIGINAL SIZE** command in the **UTILS** menu restores windows (and images) to their original size.

Modifying the Image Structure

RE-SIZING AN ACTIVE REGION

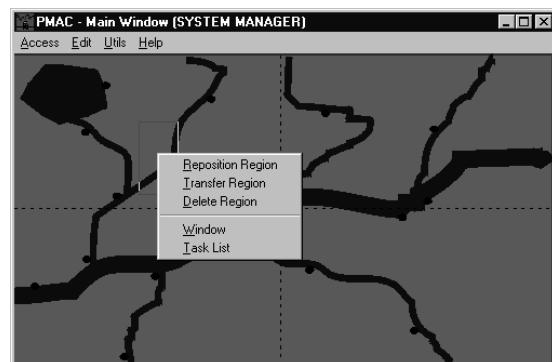
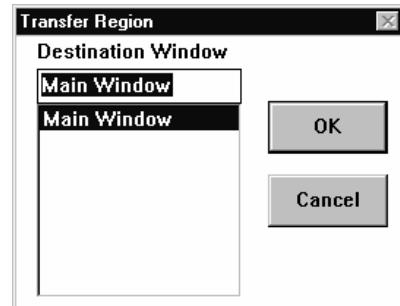
To Re-size an active region within a window:

- Run PMAC Plus with system manager access.
- Enable active region editing – see **Active Region Editing Mode** earlier in this section.
- Move the mouse pointer into the region to be modified and click the left mouse button; a menu will appear. Select **REPOSITION REGION** from the menu.
- Position the mouse pointer at the top left corner of the position where you wish to re-locate the region. Click and hold the left mouse button down and drag the mouse pointer to create the box, which will become the active region. When the box is the correct size in the new position release the mouse button.
- Check that the active region has been created correctly in the new position by moving the mouse pointer across the area of the box. While the pointer is within the active region, the region should be displayed. If this does not happen, the region may have been created too small, or it may have overlapped another region, which is prohibited.

MOVING AN ACTIVE REGION TO ANOTHER WINDOW

To transfer an active region to a different window:

- Run PMAC Plus with system manager access.
- Enable active region editing - see **Active Region Editing Mode** earlier in this section.
- Move the mouse pointer into the region to be transferred and click the left button; a menu will appear. Select TRANSFER REGION from the menu.
- A **Transfer Region** window (right) will appear showing a list of windows that you may transfer to. Select the desired window then click **OK**.
- The target window will then be shown.
- Position the mouse pointer at the top left corner of the position where you wish to re-locate the region. Click on the new location for the top left corner of the region, drag the pointer to create a box of the required size and release the mouse button.
- Ensure that the region is still highlighted as the mouse pointer passes over it. If this does not happen, the region may have been created too small, or it may have overlapped another region, which is prohibited.



DELETING AN ACTIVE REGION

If an active region has no sub regions it may be deleted.

- Run PMAC Plus with system manager access.
- Enable active region editing - see **Active Region Editing Mode** earlier in this section.
- Move the mouse pointer into the region to be deleted and click the left mouse button; a menu will appear (see previous page). Select **DELETE REGION** from the menu. If **DELETE REGION** is greyed-out, then the region contains sub-regions, which must be removed before deletion is allowed.

Setting Up Sites Within Bitmap Images

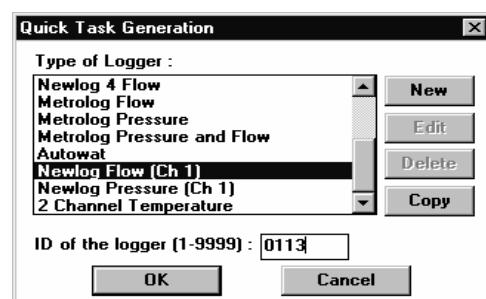
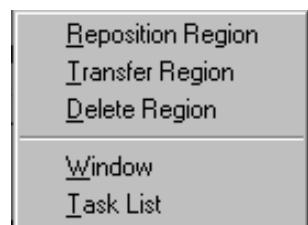
Entering each site (registering it on the database) is normally a once-only operation (i.e., once a site has been created it does not need to re-created at a later stage). It is recommended that all sites be created using the **Site Database** window during commissioning of PMAC Plus.

Sites can then be added to the appropriate bitmap images (when the image structure is sufficiently complete) by creating an active region and generating a task list linked to that active region - see **Creating a Task List** below. Although generally located at the lowest level, site task lists may be created in any PMAC Plus window. The creation of sites starts with the creation of a task list. The introduction of the logger is highly dependent on the specific application, refer to the relevant section for a more detailed explanation.

Creating a Task List

Creating a Task List for each site effectively programs the site with the ID number of the associated logger. As the ID number is the same as the Site ID, creating the task list also links that site, as an active region, to the site with that ID number which has already been created in the **Site Database** window. Create a task list as follows:

- Run PMAC Plus with system manager access.
- Enable active region editing - see **Active Region Editing Mode** earlier in this section.
- Position the mouse pointer at the top left corner of the position where you wish the site active region to appear. Click and hold the left mouse button down and drag the mouse pointer to create the box, which will become the site active region. When the box is the correct size in the new position release the mouse button.
- Check that the active region has been created correctly in the new position by moving the mouse pointer across the area of the box. While the pointer is within the active region, the region should be displayed. If this does not happen, the region may have been created too small, or it may have overlapped another region, which is prohibited.
- Move the mouse pointer into the active region and click the left mouse button; a menu will appear (right). Select **TASK LIST** from the menu and release the mouse button.
- When the **Task List** window (right) appears click on **QUICK**.
- In the **Quick Task Generation** window (below right) select the logger type fitted at this site. Click on the ID box and enter the Logger ID number (this must be the same as the PMAC Site ID number - see **Section 3 Commissioning PMAC Plus - Registering Sites on the Database**). Click on **OK**. When the **Task List** window re-appears click **OK** again.
- To check that the task list has been correctly created, move the mouse pointer across the area of the box and click the left mouse button. In addition to the menu options normally seen when editing active regions, the menu should start with relevant menu options, e.g. Pressure and flow, or inlet and outlet.
- Disable active region editing by re-selecting **EDIT** - **ACTIVE REGION** from the menu bar. The creation of the active region is now complete, however the site must be entered into the database before the region can be used - refer to **Section 5 Using the Site Database - Creating a New Site**.



Modifying a Site Task List

- Run PMAC Plus with system manager access.
- Enable active region editing - see **Active Region Editing Mode** earlier in this section.
- Move the mouse pointer into the active region and click the left mouse button; a menu will appear. Select TASK LIST from the menu and release the mouse button. The **Task List** window opens.
- Selecting QUICK re-opens the **Quick Task Generation** window for the site and allows you to change to a different logger type or to change the Logger ID number (this must remain the same as the PMAC Site ID number - i.e. the Site ID number must also have been changed).
- If you select a task in the **Task List** window, the following options become available:
 - UP - click this to move the selected task one step upward in the list.
 - DOWN - click this to move the selected task one step downward in the list.
 - ADD - click this to add another task.
 - EDIT - click this to edit the selected task.
 - DELETE - click this to delete the selected task.

5 Using The Site Database

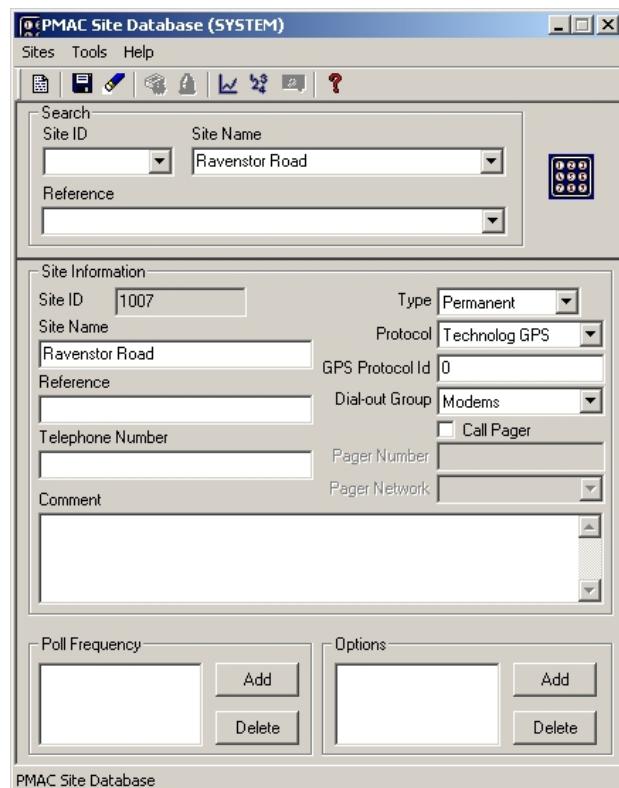
Introduction to the Site Database

The **Site Database** is used for the management of all sites. It can be used to create, edit and delete sites, to configure communications with specific sites (not global configuration), to access data relating to each site, to display the data in graph and/or value table formats and also to control polling.

The Site Database is accessed through the UTILS - SITE DATABASE menu option in the **PMAC** windows, or by clicking directly on the Site Database menu icon in the main menu toolbar .

The **Database** window has a menu bar and tool bar which provide access to the site database functions.

The window is split into four key parts: Search, Site Information, Poll Frequency and Options.



Menu Bar Options

Notes:

1. Some menu bar functions may not be available to you if you have Normal Operator or Casual Operator access.
2. Some menu functions are also available from the Tool Bar – see **Tool Bar Options** later in this section.

SITE MENU

New	Opens the Create a New Site window to enable the creation of new sites.
Save	Save changes to site details.

Delete Deletes a selected site. Provides option to delete site from database, delete logger settings file for the site or delete data files for the site.

Poll Settings Enables time of polling, retry options etc. to be set.

Exit Closes the **Site Database** window.

TOOLS MENU

Edit Logger Settings Edit logger settings opens the Logger Settings Editor for a selected site.

Alarm Wizard Edit / configure high/low, and diurnal profile alarms in supported data loggers.

Graph Opens the **Graph** window with data from the selected site displayed in graphic format.

Values... Opens the **Values** window with data from the selected site displayed in a table.

Index Viewer view daily index readings sent to PMAC by index supported data loggers

HELP MENU

Index Access to on-line help.

About Displays the **About PMAC Site Database** window.

Tool Bar Options

Note: Some tool bar functions may not be available to you if you have Normal Operator or Casual Operator access.



Opens the **Create a New Site** window to enable the creation of new sites.



Save changes to site details for the selected site.



Deletes a selected site. Provides option to delete the selected site from the database, delete logger settings file for the selected site or delete data files for the selected site.



Edit logger settings opens the Logger Settings Editor for the selected site.



Edit / configure high/low, and diurnal profile alarms in supported data loggers.



Opens the **Graph** window with data from the selected site displayed in graphic format.



Opens the **Values** window with data from the selected site displayed in a table.



view daily index readings sent to PMAC by index supported data loggers



Displays the **About PMAC Site Database** window.

Creating a New Site

The Site Database can be used to create new sites.

Use either the SITES - NEW menu option, or the  button to open the **Create a New Site** window (right).

To create a new site, you must enter the PMAC Site ID, Site Name, Reference, Type and Protocol. Please remember when entering the Telephone Number for the site that if you wish to use the predial prefix then you will need to put a ~ symbol before the number.

By default PMAC Plus will identify the site type as Permanent; this means that each time the logger is downloaded, the data will be appended to the existing file. Temporary sites are those where a new file is created each time the logger is downloaded.

If a single protocol has been installed, PMAC Plus will automatically select that protocol.



Note: PMAC Plus requires each logger to have a unique identification number (ID – Range 1 - 9999) which is the same as the Site ID number. This ID is used by PMAC Plus to control the access to data; if two loggers are given the same ID then this may result in invalid data.

You must enter a site name and reference; optionally, you may enter a telephone number or NUA (for an X.28 PAD) - this is only required when the logger is connected to a telephone line.

If you want to use a pager you will have to select **Call Pager** to produce a tick in the box, then enter the **Pager Number and Pager Network**.

Once all required details have been entered, click on OK. PMAC Plus will complete the creation of the site.

Selecting a Site in the Database

To access a specific site using the Site ID, either:

- click on the Search - Site ID box and type in the required ID. The search starts automatically as you finish typing the ID number.

Note: The search is done on a numeric basis, thus if you type in 32, then site 32 will be found before, for example, site 320.

- open the Site ID drop-down list box, scroll to the required site and select it.

Accessing a specific site using the Site Name is similar to searching for a specific ID:

- click on the Search - Site Name box and type in the required name. The search starts automatically as you finish typing the name.

Note: It is only necessary to enter the minimum number of letters required to uniquely identify the site. For example, if the database contains sites called JACKSON STREET and JAMES STREET, you only need to enter JAC to find the first and JAM to find the second.

- open the Site Name drop-down list box, scroll to the required site and select it.

Editing a Site in the Database

The Site Database can be used to edit details of a site, as follows.

1. Access the site as described in Finding a Site in the Database, above.
2. Modify the site details as required and either:
 - select SITE - SAVE from the menu bar, or
 - click on the  button.

Changing Autopollling Settings

Autopolll settings are only applicable when using a remote communications system, e.g. a telephone line connected to a modem, which is attached to the PC. Poll frequency allows you to define when a site will be contacted.

To add a new polling time for a site, click on the ADD button in the **Poll Frequency** field. The **Add Poll Time** window (right) opens. This offers the following polling options:

- Hourly
- Daily
- A particular day in each week
- A particular date in each month



Scroll through the list and select the required polling frequency from the listed options.

Notes:

1. *Polling of sites starts at the time specified in the SITES - POLL SETTINGS menu option and is executed in ID order.*
2. *Hourly polling is only performed while the 'Hourly Poll' program is running.*

Changing Options

The Options field allows you to select from the available options as follows:

• Use PMDATRAN	PMAC will export data to an external MDB database.
• Index Only	For use with Technolog protocol loggers recording flow (e.g. Newlog, Metrolog or Utilog) - requests the download of the logger index only.
• Suspended	Used to temporarily stop autopollling for a particular site without deleting the other poll settings for that site. This option can be set automatically.
• Inbound Write	Used mainly with Utilog loggers that can be programmed to dial in and transmit data automatically. This option enables the data to be downloaded automatically.

Deleting a Site

A site may be deleted using the SITE - DELETE menu option, or using the  button.

The **Delete Site** window provides options to delete the site from database, delete the site logger settings file, delete the data files for the site, delete the AAPs or delete ancillary files (.MIF,.AIF,.IIF). Select the required options and press **OK**.

If the data files are not deleted then the entry in the database will be removed but the data will remain for later use.

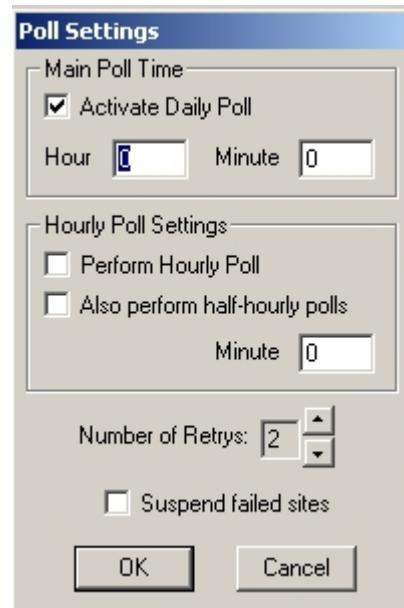
Important Note: *If data is deleted from the database, the data CANNOT be recovered.*

Changing Global Polling Settings

Select SITES - POLLING OPTIONS to open the **Poll Settings** window (below right).

The **Poll Time** is the time of day that the polling operation will start (using 24-hour clock). PMAC will contact all sites set for polling on the current day, in ID order, until all required sites have been polled. The **Hourly Poll Settings** select perform hourly poll on its own or select also perform half-hourly polls, then select the minute which you would like it to poll. The **Number of Retries** allows you to define the number of additional attempts to contact a site in the event of communications problems.

Selecting the number **Retries at end of poll** is, in the event of communications with a site failing, PMAC waits until all other sites have been polled before trying again. If this option is not enabled then PMAC will retry **failed sites**. This sets the site(s) into a suspended state, preventing them from interfering with future immediately after clearing the failed call.



If communication with a site fails completely, even after retries, PMAC has the option to **Suspend** polling operations. Suspended sites must be cleared manually - see **Changing Autopoll Settings**, above. If this option is not enabled, PMAC will not suspend sites.

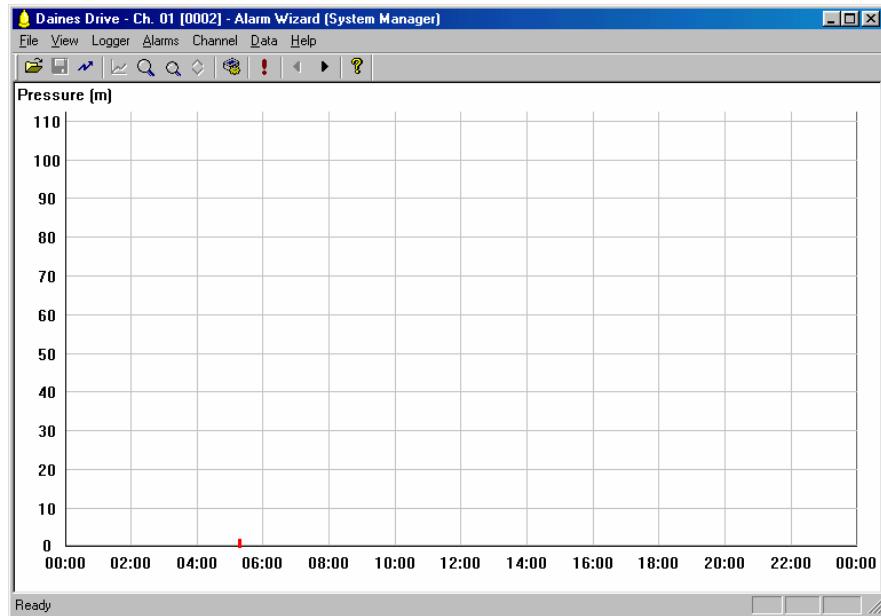
6 Alarms Wizard

Alarm Wizard is a new feature of PMAC designed for setting alarms on all Technolog data loggers capable of remote communication. This includes Cello, Newlink and Utilog.

Various alarm combinations can be set including high, low and windowed alarms along with data update on alarm and data send after alarm. The Cello also supports the more complex profile alarms.

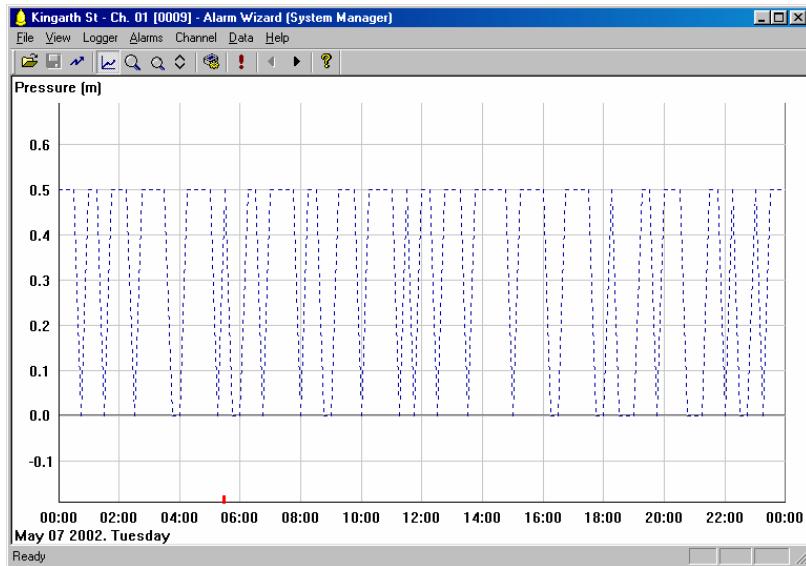
In order to amend, send or save alarm settings, log onto PMAC with System Manager privileges.

Alarm Wizard is loaded by clicking on the Alarm Wizard  icon on your chosen site in the Site Database. Upon loading, you will be presented with the screen below. This window is displayed whenever Alarm Wizard is running. It has a menu bar and tool bar which provide access to Alarm Wizard functions.



In order to set or edit alarms reliably, you should load the data file (.dat found in the pmac/data directory) for your chosen logger and data channel.

- (i) Click on File-> Open and load the .dat file for the particular channel of the logger you wish to create alarms for.
- (ii) You should now see one day of data for the chosen logger. Use the arrow keys to move around the data or the scroll bars on the data axis.



In the case of Cello, a red mark will be visible at the bottom of your screen of data. This is the current dial-in time of the Cello.

File Menu

Open	Displays the Select Data File window to enable the user to choose which channel to set/view alarms on.
Read from Local Logger	Reads the current alarm settings from the logger attached to the communication port.
Send to Local Logger	Downloads the current alarm settings to the logger attached to the communications port.
Send to Remote Logger	Sends the current alarm settings to the remote logger via the appropriate modem. If the modem is currently in use, the details are placed on the queue.
Exit	Exit the Alarm Wizard program.

View Menu

Toolbar	Ticked when enabled (Tool Bar displayed).
Status Bar	Ticked when enabled (Status Bar displayed).
Data	Ticked when enabled (Data displayed).
Zoom In	Zooms in on the Y-axis of the current data.
Zoom Out	Zooms out on the Y-axis of the current data.
Auto Scale	Automatically scales the Y-axis to provide the best possible fit for the data currently being displayed.

Logger Menu

View Settings	Displays the current global and channel settings for the chosen logger.
Dialout Settings	Displays the current Dialout settings for the chosen logger, these are: Enable regular wakeup / Dialout Numbers / Dialout Options / data send frequency and Message check frequency.

Alarms Menu

Alarms Setup	Opens the Alarm Settings window. Enables the setting of high, low, windowed and profile alarms (if applicable). Enables the changing of dial in times and data on alarm.
Raise Profile	Raises the current alarm profile by 1/256 of the full scale.
Decrease Profile	Decreases the current alarm profile by 1/256 of the full scale.
Increase Deadband	Increases the current profile alarm deadband by 1/256 of the full scale.
Lower Deadband	Decreases the current profile alarm deadband by 1/256 of the full scale.

Channel Menu

Next	Displays the data on the next logged channel.
Previous	Displays the data on the previous logged channel.

Data Menu

Back one day	Moves the data back by one 24hr period.
Forward one day	Moves the data forward by one 24hr period.
Catch this Day	Uses the data shown on screen to create a Cello alarm profile. This option is only suitable for very repeatable data.
Merge Data	Averages the current drawn profile with the data shown on the screen. Repeatedly using this option will eventually give the same result as Catch this Day.
Catch High Alarm	Identifies the highest data point shown on screen and sets the high alarm at that value.
Catch Low Alarm	Identifies the lowest data point shown on screen and sets the low alarm at that value.

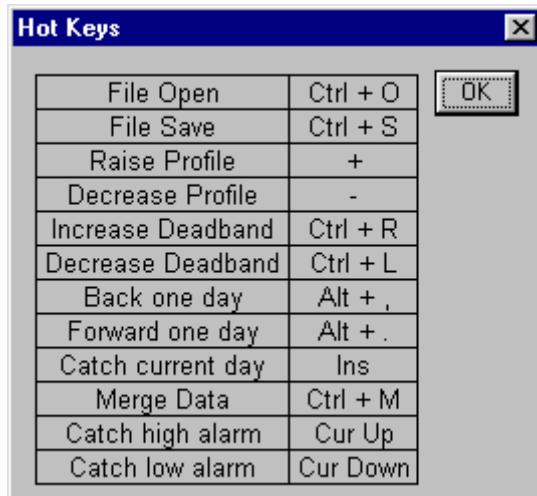
Help Menu

Show Welcome Screen

Selecting this option will enable the welcome screen to pop up when the alarm wizard is opened.

Keyboard Map

Shows the shortcut keys for the Alarm Wizard (below).

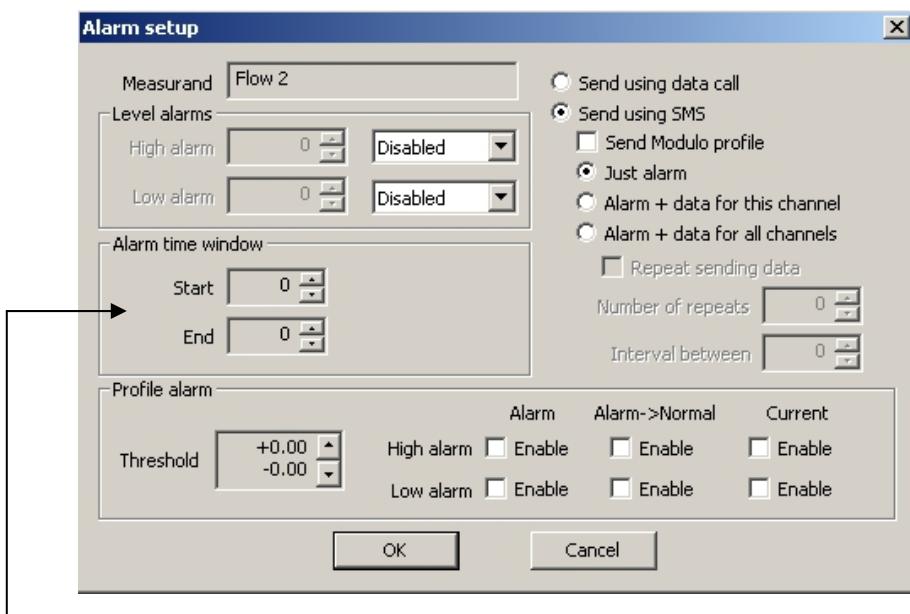


About Alarm Wizard

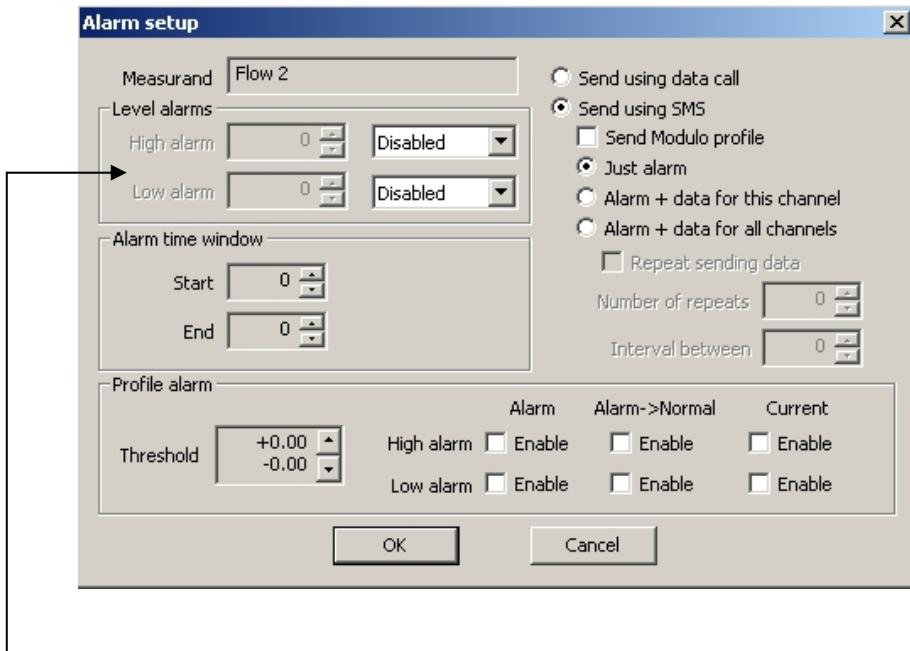
Displays the version number for both the Alarm Wizard and PMAC Plus.

Setting Alarms

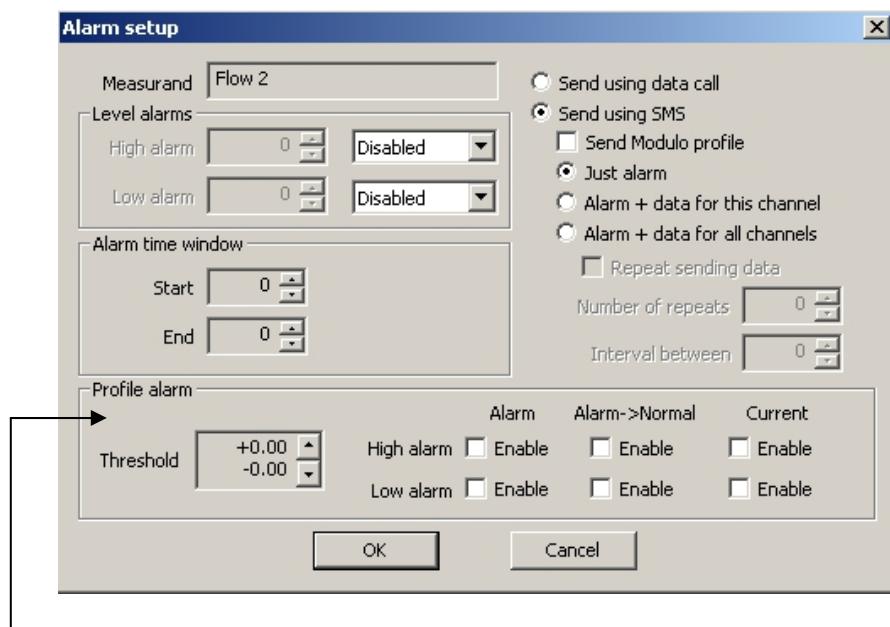
All Alarms are set using the Alarms Setup option on the Alarms menu. This will display the Alarm Settings window that contains four or five tabs depending upon the type of data logger you are setting alarms for.



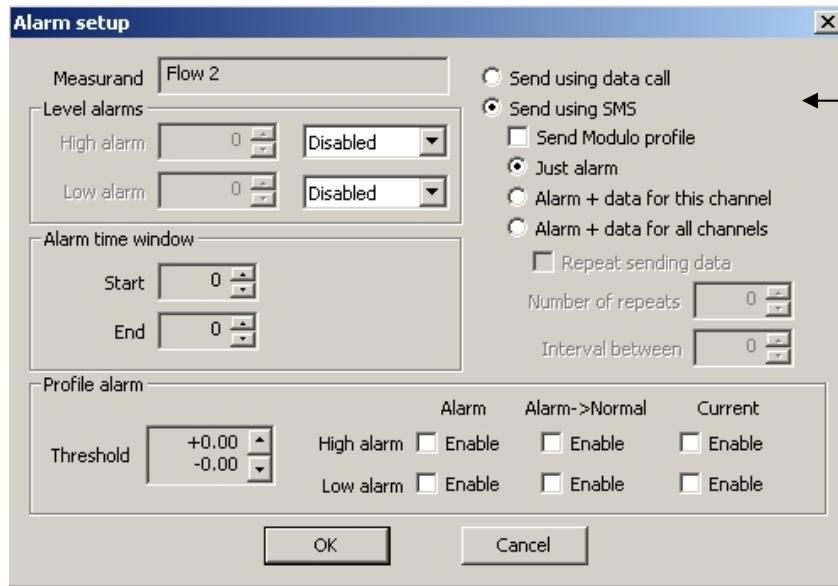
The Alarm time window enables the user to set a windowed period during which alarms are valid. This period is set using the 24hr clock and is applicable to High and/or Low alarms.



The Alarm levels window enables the user to set High and/or Low alarms. The alarm levels can also be adjusted on screen. Regular Dial-out can be enabled disabled and windowed at a chosen time and where appropriate the logger can be set to send index readings to the host PC along with the regular data.

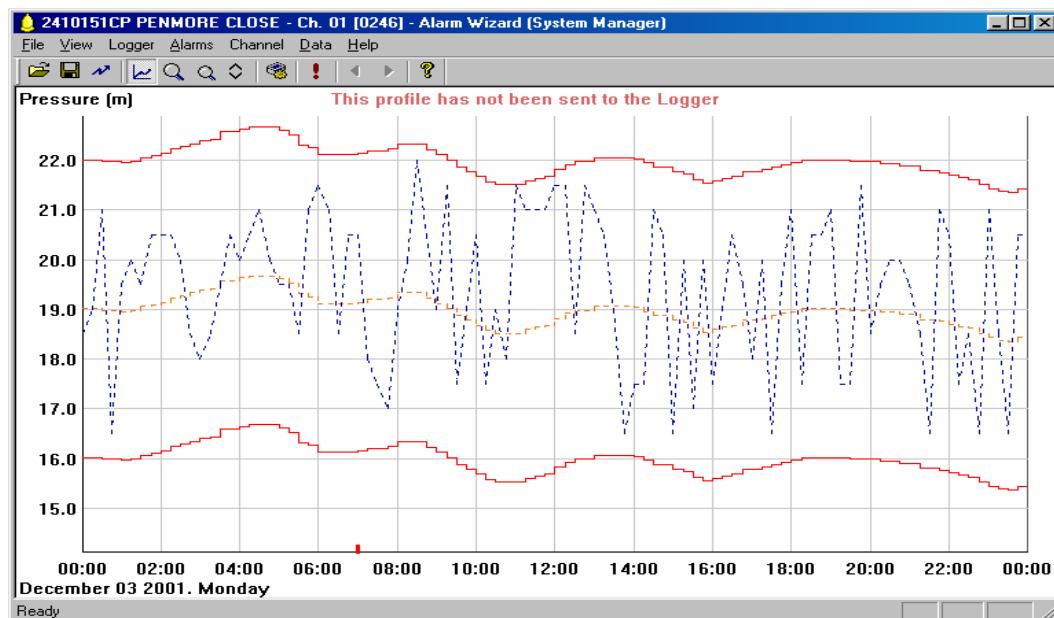


The Profile alarms window is only visible for Cello alarms. Form here, the user can set the value of the deadband outside which an alarm will be triggered. The 'Alarm' / 'Alarm to Normal' / 'Current' status alarm can also be enabled if required. Current alarms are used in conjunction with Modulo.



Data on Alarm enables data send via Data Call or SMS, Send Modulo profile, Just alarm, Alarm + data for this channel, Alarm + data for all channels when the alarm state occurs. Along with follow up data at predetermined intervals as appropriate.

Once alarms are set, press OK. The selected alarms will appear on screen. Alarms are shown in red around the data in blue. Windowed alarms are shown in red dashed lines. Cello profile alarms are shown in orange dashes with the corresponding deadband limits above and below in red solid lines. The profile can be adjusted from the default flat line at zero, by drawing on top of the data.



Adjustments can be made either by returning to the Alarm Setup window or by altering the alarms (drag and drop) on screen. Following on from any adjustments a message will be displayed at the top of the screen stating 'This profile has not been sent to the Logger'.

Once you are satisfied with the alarms, send the setting information to the Logger. This can be done locally or remotely.

Locally, click on File -> Send to Local Logger.

Remotely, click on File -> Send to Remote Logger.

At this point you may also be requested to save the alarms details to the .lgr file. PMAC will contact Newlink, Utilog and other PSTN loggers immediately. An SMS message containing alarm details is sent to the Cello and will be received at the next wake-up time. When alarms are received by the data logger, an acknowledgement is sent to PMAC. This confirmation is visible at the top of the Alarm Wizard screen.

It is important that Cello alarms are set with great care as many messages may be wasted if the alarm limits are set inappropriately.

Cello profile alarms are not supported for Cellos before Version 3.33.

When using Profile alarms, Cello has a single byte to store the deadband range. This is independent of the recording type. For example:

Typical settings would be
Pulse significance = 0.01 CUM
Logging rate = 15 minutes

1 pulse in 15 minutes = 0.04 cum/hr
255 pulses (1 byte) in 15 minutes = 10.2 cum/hr

Please note, 10.2cum/hr is the range of the deadband, this actually gives +/- 5.1 cum/hr above and below the profile.

Dialout Settings

This window allows you to set the dial-out numbers, wake-up options and alarm configuration.

Dial out numbers

The "PMAC Dialout" numbers are for any logger with an internal or external PSTN modem.

The "SMS Data" number is the number of the host PC's communication device (i.e. GSM modem).

The "Modulo Number" is used for Cellos that are part of Modulo control systems only.

Regular Wake-Up Options

This section allows you to enable/disable the logger's regular wakeup and also set the time you want the logger to wake up. You can set the time of the wake-up by using the up and down arrows next to the hour and minute boxes. To enable a regular wake up you must place a tick in the "Enable regular wake-up" box.

Data Send Frequency

This allows you to set when and how regularly you would like the logger to send data. The options are **daily/weekly/monthly** with the **hourly** option. If the hourly option is chosen, you can tell the logger to sync with midnight or sync with regular dial out time (set on previous window). You can also set the day of the week or month that the wake up is to happen using the drop-down box.

Check For Messages

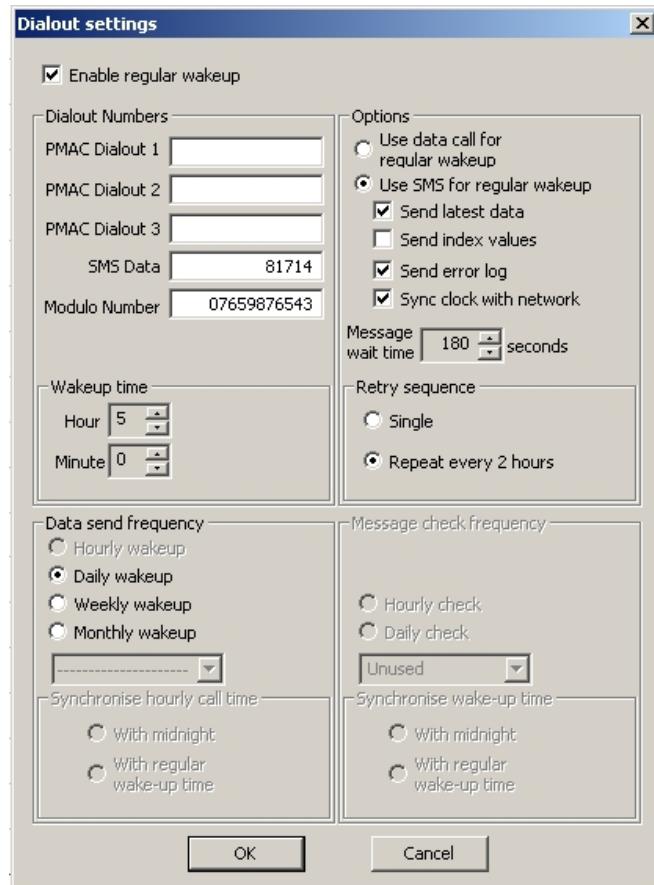
(Cello only) – This section allows you to set when you would like the logger to check for messages. The options are **daily or hourly** for Cello version 3.43 and later. If it is set to send data hourly you can set it to sync with midnight or sync with regular wake up time.

Options

Use data call for regular wake-up tells the logger to wake-up and use a data-call to contact and send data to PMAC. This is the default (and only) option for Newlogs and Utilogs, but Cellos should normally be set to **Use SMS for regular wake-up**.

For Cellos that are set to use SMS messages, more options are available:

- **Send latest data** - This tells the logger to send its latest data at the normal data-send wake-up time.
- **Send index values** - This tells the Cello to send the index values for all relevant channels at the normal data-send wake-up time.



- **Send error log entries** - Cellos maintain a log of network and other errors. This option tells the Cello to send the error-log when there is something new to send at the normal data-send time.
- **Synchronise clock with network** - This option lets the Cello maintain its internal clock using the GSM network. The Cello will trim its clock's minutes and seconds to match the GSM network, but will maintain the user-set clock hour.

When using SMS messages for regular data sending you can set the **Message Wait Time**. This is done by clicking on the drop down box and selecting a time between **disabled** and **600 secs**.

The message wait time sets the length of time the Cello stays awake listening for commands from PMAC. This is normally left at the default **120 secs**, but on sites where data gaps are appearing it may be useful to increase this to 300 or 600 seconds. This time includes the time it takes for the Cello to send all of the data and other messages that it needs to transmit.

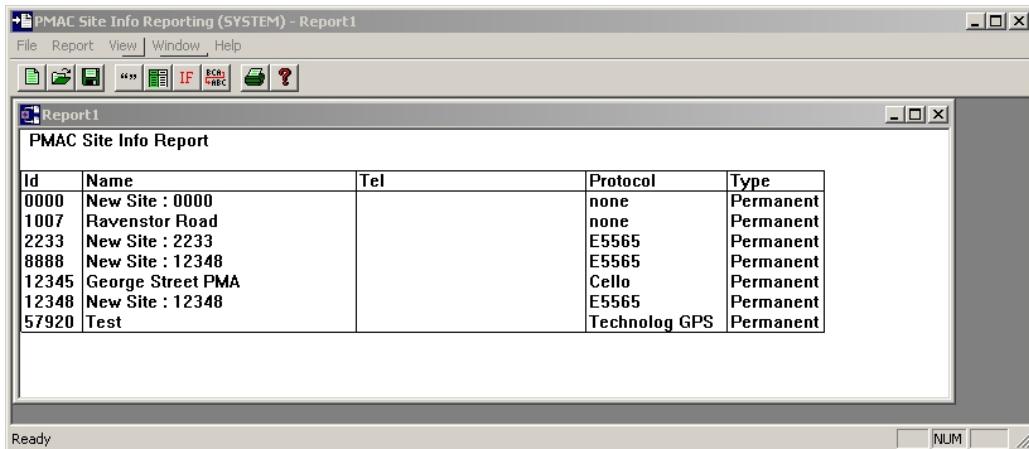
If you would like the unit to repeat sending latest data, you can now select the **Retry sequence** this can be **Single or Repeat every 2 hours**.

Once all changes have been made in the window, clicking **Ok** will write the changes to the attached logger and close the window. Clicking **Cancel** will exit the window without making any changes to the logger.

7 Site Information Report

The Site Report Window

When selected, each site is displayed inside the **Site Report** window.



The **Site Report View** window has a menu bar and tool bar that provides access to the functions required to use the Report files.

Menu bar options

FILE MENU

New (Ctrl + N)	Creates a new, blank PMAC report document.
Open (Ctrl + O)	Opens a saved PMAC report.
Save (Ctrl + S)	Saves the current displayed PMAC report.
Save As	Saves the current displayed PMAC report with a different name and into a different directory if required.
Copy to Clipboard	Copies the current displayed report for pasting into another document – e.g. A Clipboard.
Print	Prints the current displayed report.
Print Preview	Displays a preview of the page to be printed.
Print Setup	Enables printer selection and set up.
Recent File	Lists recently accessed files.
Exit	Closes the Report program.

REPORT MENU

Comment	Opens Report Comment window - allows attachment of comment to selected log.
Columns	Allows addition and deletion of topic columns in report windows.
Criteria	Opens Criteria window for the selected log type - allows setting of criteria appropriate to the log type. Allows filtering out of unwanted entries.
Sort	Opens the Sort window - allows selection of primary and secondary sort parameters.
Show SQL	Displays the underlining Structured Query Language (SQL) statement that is created from the options selected in the columns and the sort and filter options. Normally only used in support of the software.

VIEW MENU

Toolbar	Ticked when enabled (Tool Bar displayed).
Status Bar	Ticked when enabled (Status Bar displayed).

WINDOW MENU

New Window	Opens a new Report window of the currently selected type.
Cascade	Cascades multiple windows.
Tile	Tiles multiple windows.
Arrange Icons	Re-arranges minimised Report windows within Report View window.
Open windows	All open windows are listed at the bottom of the menu.

HELP MENU

Index	Access to on-line help.
<u>About Pmacrept...</u>	Displays the About PMAC Site Info Report window.

Tool Bar Options

Note: Some tool bar functions may not be available to you if you have Normal Operator or Casual Operator access.



Opens the **New** window - enables opening of a new alarm, comms or user log.



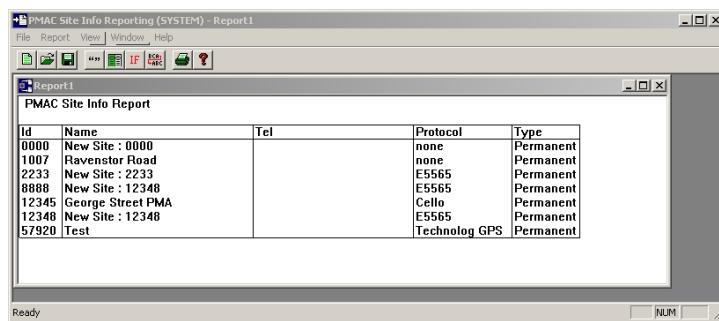
Enables selection and opening of a previously saved view of a log.



Saves a view of a selected log. If previously unsaved, opens **Save As** window.

-  Opens **Report Comment** window - enables attachment of comment to selected log.
-  Enables addition and deletion of topic columns in report windows.
-  Opens **Criteria** window for the selected log type - enables setting of criteria appropriate to the log type.
-  Opens the **Sort** window - enables selection of primary and secondary sort parameters.
-  Opens **Print** window - enables printing of selected log.
-  Displays the About PMAC Log Reporting window.

The Site Information Report is accessed through the UTILS - SITE INFO REPORT menu option in the **PMAC** windows, or by clicking directly on the Site Info Report icon in the main menu toolbar .



The Site Information Report is used to view each sites details that have been stored in the site database.

The options as described above in the menu bars can be used to filter all of these sites to create a report of a selected few. This is done by selecting the columns that you wish to be viewed using the columns option in the REPORT menu. Then the sites can be filtered by selecting the CRITERIA option in the REPORT menu and selecting the criteria you wish to view i.e. Sites with an ID between 1000 and 2000 etc...

Once you have gathered all of the sites you wish to view in the report. You can now Save/Copy or Print the document by selecting the appropriate heading from the FILE MENU.

8 Downloading Data

Local Data Retrieval Sites

These are sites, which are not connected to a telephone line or other remote communication system. Data is recovered either by connecting the loggers directly to the PC or by use of a data retrieval unit such as a Psion II, Psion Workabout or Datamaster.

The Local Comms Window

To open the **Local Comms** window, select UTILITIES - LOCAL COMMS from a **PMAC** window menu, or select  from the main menu toolbar.

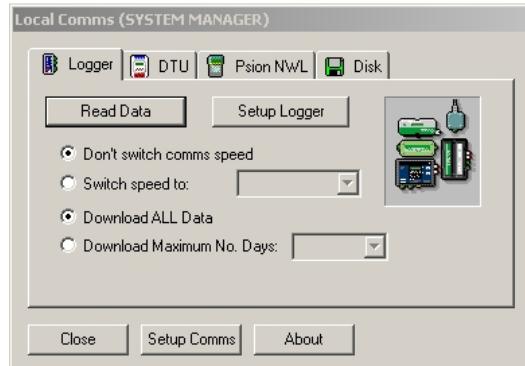
The window is divided into several pages representing the available local comms devices. These can be accessed by clicking on the "tabs" running along the top of the window.

*Note: Only those tabs appropriate to enabled devices will be available. Other devices can be added by enabling them in the **Comms Setup** window; changes will only be applied when the **Comms Setup** window is closed.*

Download Data from a Logger

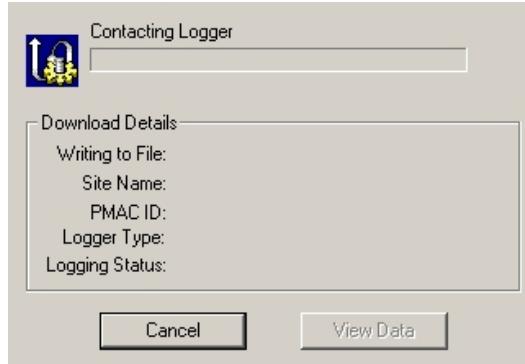
This page allows access to a Logger connected directly to a communication port on the PC by an appropriate cable. The **Local Page** in the **Comms Setup** window must be set to an appropriate COM port, otherwise the tab will not be shown - see **Section 3 Commissioning PMAC Plus - Configuring Communications**.

- Connect the logger to the PC.
- Open the **Local Comms** window (right) and click on the **Logger** tab.
- Click on **Read Data**.



- The **Local Logger Download** window (right) appears and displays the progress of the download.

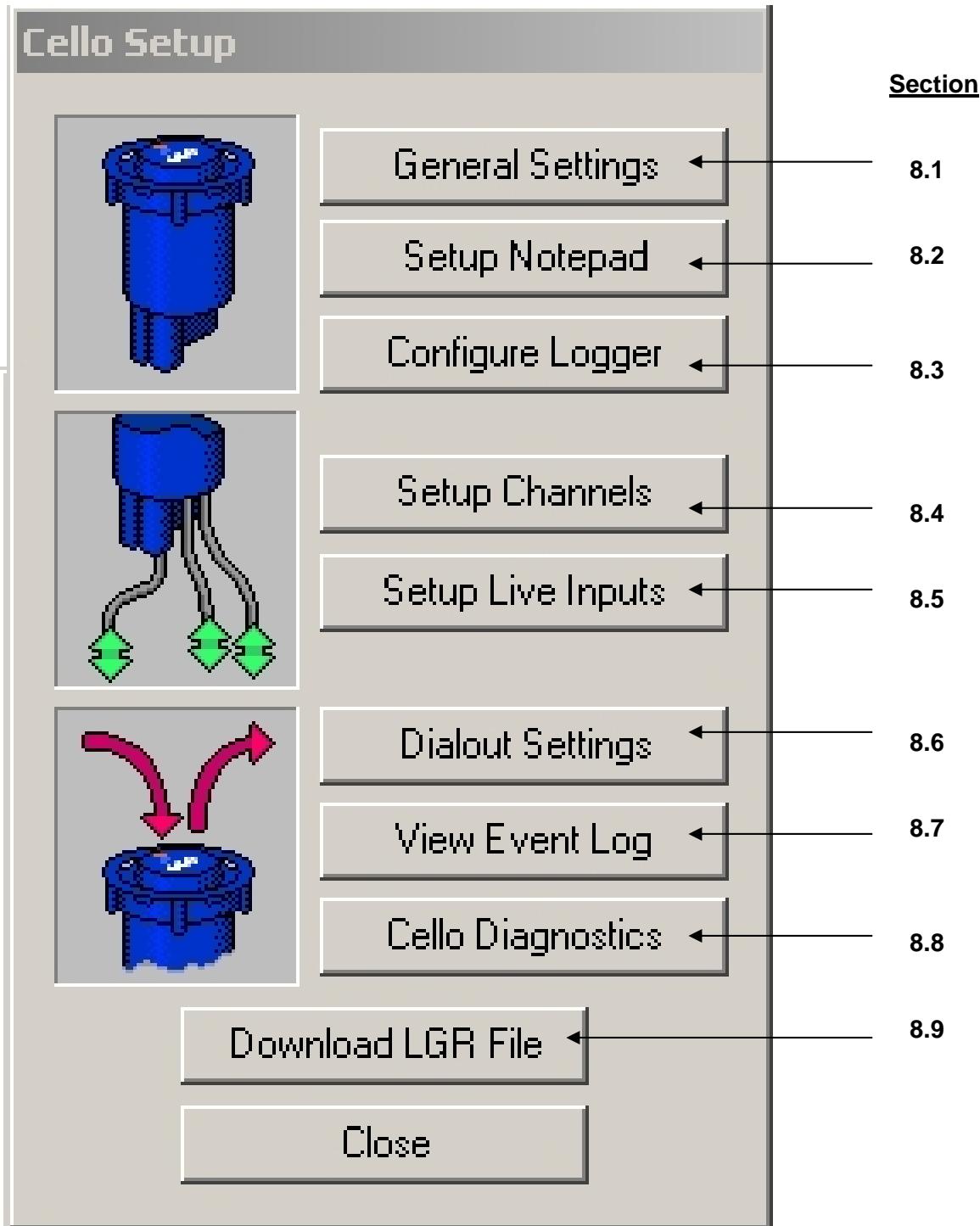
Click on **Show Details** if further information is required. This includes Site Name, PMAC ID, Logger Type, Logging Status, Data File Start/End and Logger Download Start/End. The **Local Comms** window will reappear when the transfer is complete.



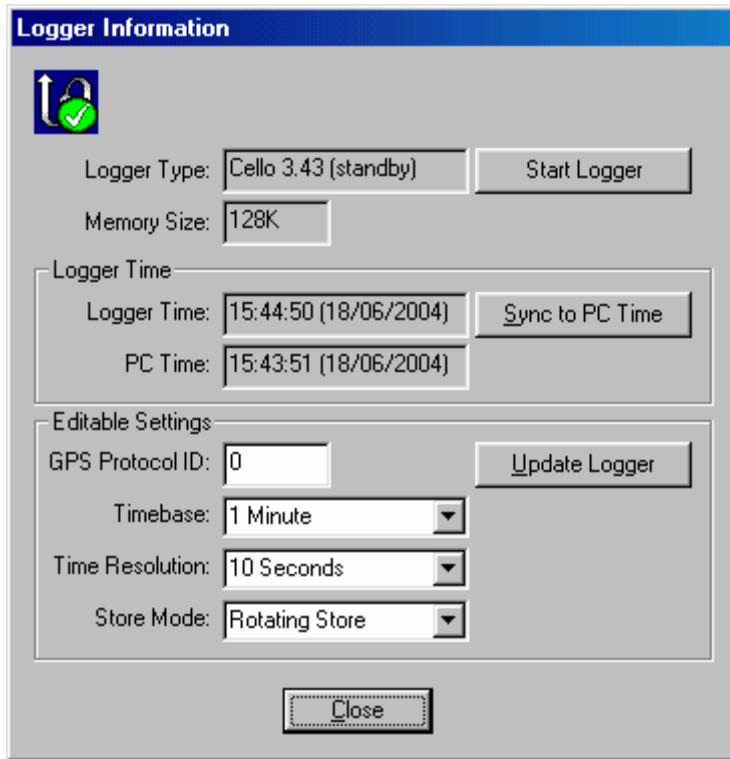
Logger Window Options

Logger Setup

From the PMAC Local Communications menu click on the button labelled **Setup logger**. This menu will vary depending on which specific logger you are using, although the main headings will be the same.



8.1 General Settings



This window shows general information and settings from the attached logger. It also allows you to stop and start the logger, set the clock and change some basic settings.

Start logger – After setting up all of the functions of the logger click on Start Logger to start the logger logging. If the logger is logging the "start logger" button changes to "stop logger".

Logger Time – Clicking on Sync to PC Time will synchronise the time on the logger to that of the PC.

GPS Protocol ID – This allows you to give the logger a specific ID. If you have a number of loggers at one site sharing a telephone line, you can communicate with each one separately by giving each of them a unique ID.

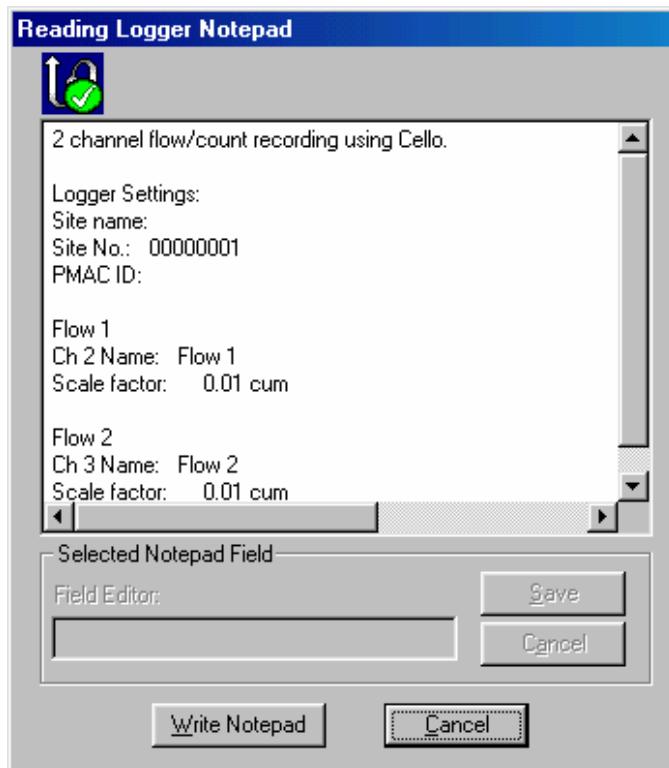
Timebase – Accessed by clicking on the drop down box and selecting a set time for the logger to wake up. At each time base 'beat' the logger checks its configuration to find out whether a measurement should be taken and responds accordingly.

Time resolution - Defines the shortest time interval in which an event can be recorded. This can be set to either 1 or 10 seconds.

Store mode – This can be set to either Rotating store (when a channel's memory is full of recorded data, the oldest day of data is deleted and the new data is stored in its place), Or Store 'til full (The logger stops logging when any channel's memory is full).

(After setting these options you must click on **Update Logger** to update the logger with your settings. If this is not done the settings will be lost when you leave the window).

8.2 Setup Notepad



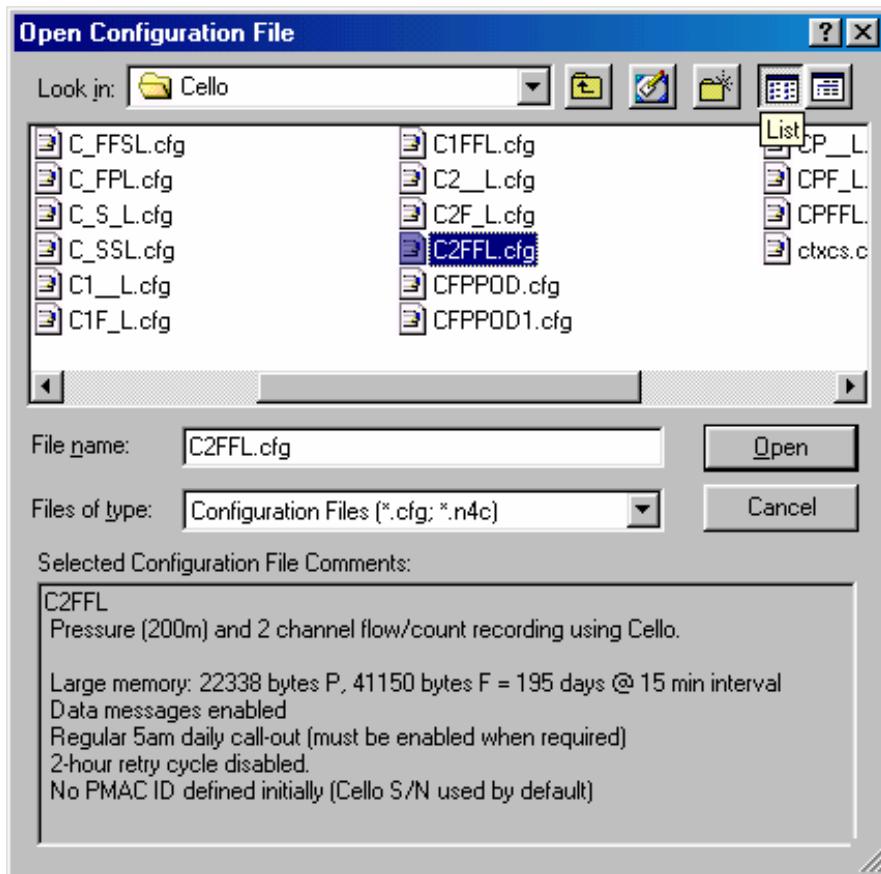
This function allows you to edit all the logger's Notepad fields e.g. **Site Name**, **Site ID**, **PMAC ID**, **Channel Name and Range**. This is done by first clicking on the field you wish to edit, then changing its details as required in the **Field Editor** and clicking on **Save**. Alternatively once a field is edited, clicking on the next notepad field to be edited will save the change to the screen.

When all required changes have been made, click on **Write Notepad** to update the logger's memory.

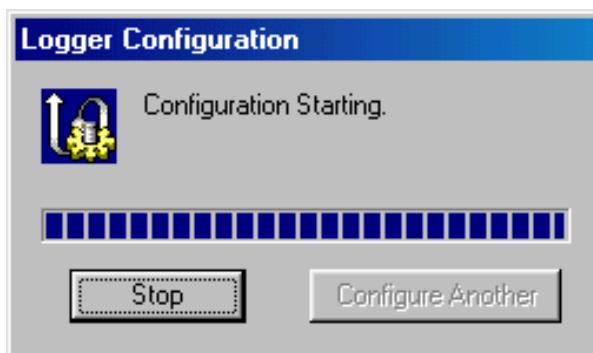
Clicking **Cancel** at any time will close the window and will not make any changes to the logger.

8.3 Configure Logger

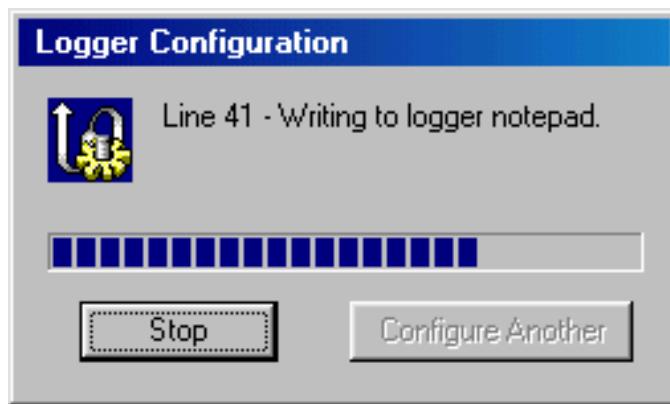
The following window will appear, allowing you to find and choose a configuration file. The window gives a brief description of the function of the configuration file selected and will also remember the last directory that configuration files were read from, cutting down the time it takes to browse for the files in future.



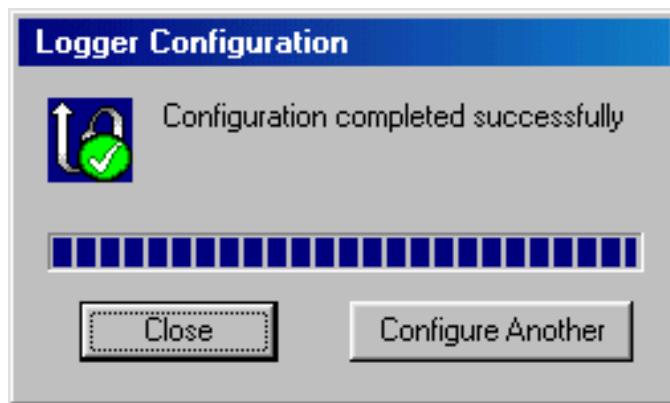
Select the required configuration file and click on the **Open** button and the following window will appear.



When the computer establishes communications the following window will be displayed whilst the logger is being configured.



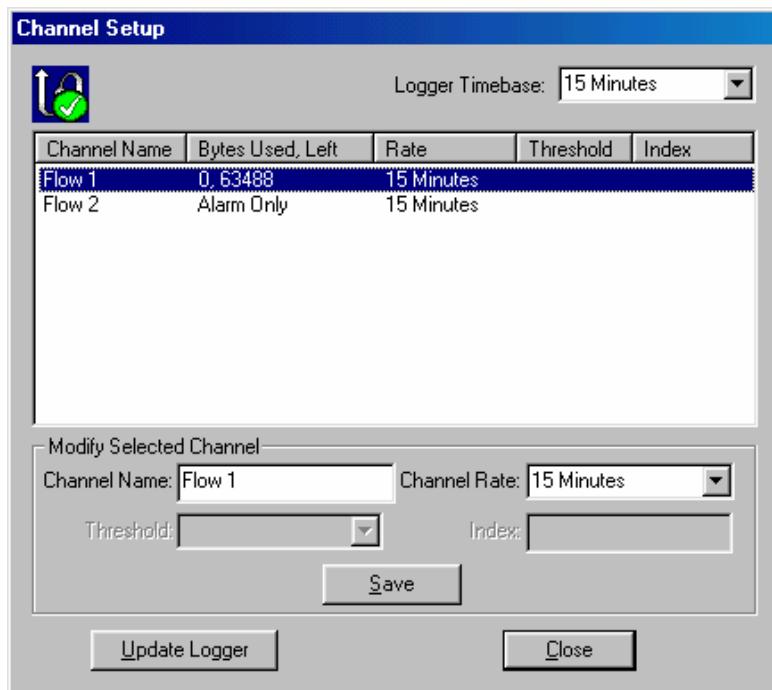
This will be followed by the confirmation of transfer window indicating a successful configuration process.



At this point the logger has now been successfully configured for the application and is ready to be set-up.

You now have the opportunity to **Configure Another** logger. This is useful if you have a number of loggers that you are trying to set up using the same configuration file. If you need to use a different configuration file you will have to click close and start the process from the beginning.

8.4 Setup Channels



This window allows you to edit the channel names and logging settings. The Logger's overall **Timebase** can be changed (see section 4.1.1). This selection will affect the logging rate of all of the channels because each channel logs at a multiple of the **Timebase**. You will see that as the Logger's **Timebase** is changed, the logging rates for all channels will change correspondingly.

Clicking on a channel will show its settings and allow them to be edited in the lower section. You can change the **Channel Name** by entering it in the channel box provided. From here you can also change the **Channel Rate** by clicking on the drop down box and selecting the rate required for that channel. If available, the logger's **Threshold** and **Index** values can be edited.

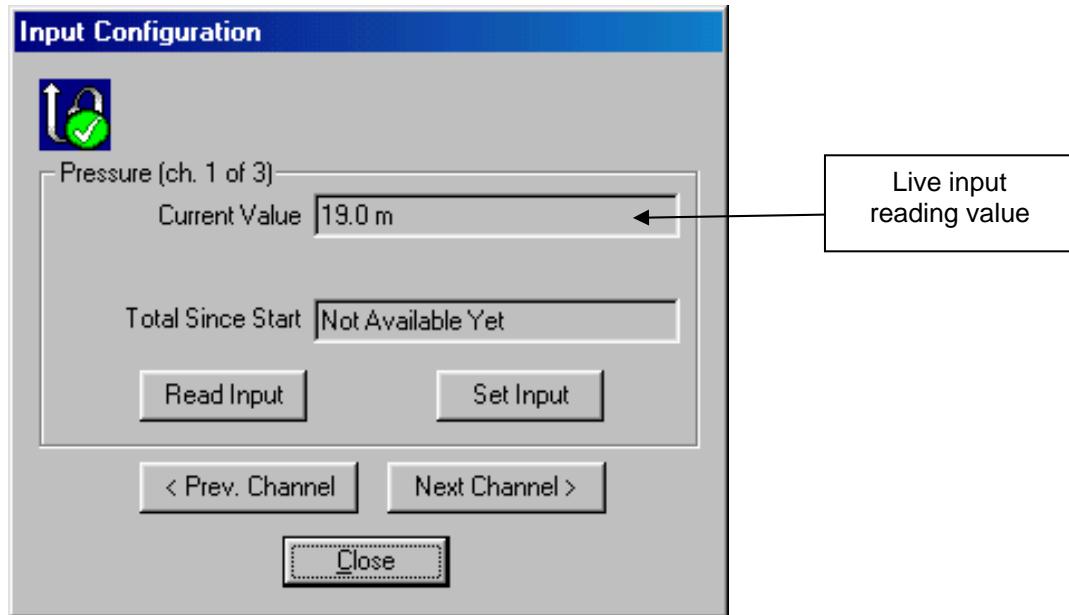
Once channel settings have been edited, clicking on either "save" or another channel in the list will update the screen with the edited details.

To write the changes to the logger and close the window, click on **Update Logger**. Clicking on **Close** will close the window without making any changes to the logger.

8.5 Setup Live Input

The "Setup Live Input" window is an excellent way of checking the installation wiring prior to setting the logger logging.

The window shown below will appear after clicking the **Setup Live Inputs** button:



Note

The software may report "Not Available yet" if the logger has not yet taken a reading. This may happen if the logger has just started logging and has not yet reached its first logging interval.

**Prev Channel,
Next Channel:**

When using multi-channel loggers this option allows selection of the channel to be read. The channels will roll-over, so clicking Next Channel when the last channel is being viewed will display the input for the first channel (the reverse is also true).

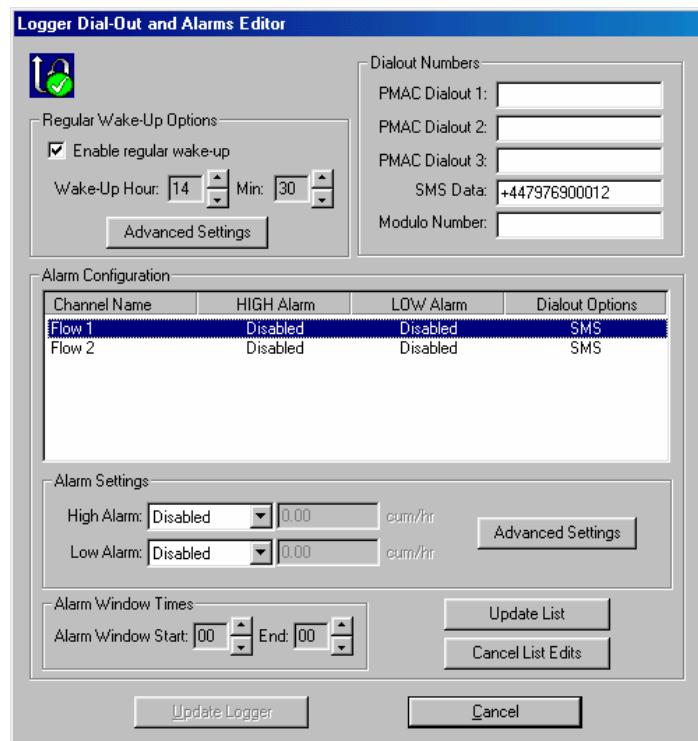
Read Input

Initiates a Read on the selected Input.

Set Input

Allows an Offset to be set for either the zeroing of a pressure transducer before installation, or matching an input with an external meter.

8.6 Dial-Out settings



This window allows you to set the dial-out numbers, wake-up options and alarm configuration.

Dial out numbers

The "PMAC Dialout" numbers are for any logger with an internal or external PSTN modem. Cellos can also use these numbers if either the advanced wake-up is set to "Data-Call" or advanced channel alarm settings are set to "Dial-Out".

The "SMS Data" number is the number of the host PC's communication device.

The "Modulo Number" is used for Cellos that are part of Modulo control systems only.

Regular Wake-Up Options

This section allows you to enable/disable the logger's regular wakeup and also set the time you want the logger to wake up. You can set the time of the wake-up by using the up and down arrows next to the hour and minute boxes. To enable a regular wake up you must place a tick in the "Enable regular wake-up" box. There are **Advanced Settings** that can be used (explained in section 4.1.6.1).

Alarm Configuration (First you must highlight the specified channel)

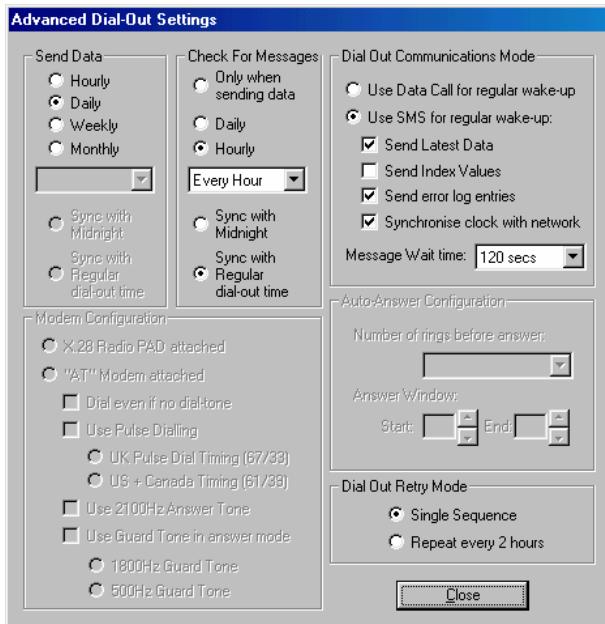
With the Alarm configuration section there are two functions to fill in.

- **Alarm Settings** – This allows you to "enable", "disable" or "window" the high and low alarms for the selected channel. If you are enabling alarms you can set the threshold for the high and low alarms to become active. The **Advanced Settings** are explained in section 4.1.6.2.
- **Alarm Window Times** – This allows you to set the start and end alarm window hours. This only has an effect on channels using "windowed" alarms. These channels will only generate alarms during the alarm window period.

After setting these options you must click on **Update List**. This will update the list with your settings. **Cancel List Edits** will cancel any changes made since the alarm channel was clicked-on.

Once all changes have been made in the window (including the advanced options described below), clicking **Update Logger** will write the changes to the attached logger and close the window. Clicking **Cancel** will exit the window without making any changes to the logger.

8.6.1 REGULAR WAKE UP OPTIONS - ADVANCED SETTINGS



There are six main sections within the "Advanced Dial-Out Settings" window:

- **Send Data**
- **Check Messages**
- **Dial Out Communications Mode**
- **Modem Configuration**
- **Auto Answer Configuration**
- **Dial Out Retry Mode**

(Some of these options may not be applicable depending on the logger type and version).

Send Data – This allows you to set when and how regularly you would like the logger to send data. The options are **daily/weekly/monthly** with the **hourly** option reserved for Cello version 3.43 and later. If the hourly option is chosen, you can tell the logger to sync with midnight or sync with regular dial out time (set on previous window). You can also set the day of the week or month that the wake up is to happen using the drop-down box.

Check For Messages (Cello only) – This section allows you to set when you would like the logger to check for messages. The options are **only when sending data**, or **daily/hourly** for Cello version 3.43 and later. If it is set to send data hourly you can set it to sync with midnight or sync with regular dial out time. You can also set the hourly frequency.

Dial-Out Communication Mode – This allows you to set the Dial-Out communications mode that you would like the logger to use.

Use data call for regular wake-up tells the logger to wake-up and use a data-call to contact and send data to PMAC. This is the default (and only) option for Newlogs and Utilogs, but Cellos should normally be set to **Use SMS for regular wake-up**.

For Cellos that are set to use SMS messages, more options are available:

- **Send latest data** - This tells the logger to send its latest data at the normal data-send wake-up time.
- **Send index values** - This tells the Cello to send the index values for all relevant channels at the normal data-send wake-up time.
- **Send error log entries** - Cellos maintain a log of network and other errors. This option tells the Cello to send the error-log when there is something new to send at the normal data-send time.
- **Synchronise clock with network** - This option lets the Cello maintain its internal clock using the GSM network. The Cello will trim its clock's minutes and seconds to match the GSM network, but will maintain the user-set clock hour.

When using SMS messages for regular data sending you can set the **Message Wait Time**. This is done by clicking on the drop down box and selecting a time between **disabled** and **600 secs**.

The message wait time sets the length of time the Cello stays awake listening for commands from PMAC. This is normally left at the default **120 secs**, but on sites where data gaps are appearing it may be useful to increase this to 300 or 600 seconds. This time includes the time it takes for the Cello to send all of the data and other messages that it needs to transmit.

Modem Configuration – This is for any logger with an internal or external PSTN modem. The user should only change these settings under guidance from Technolog.

Within this section you must highlight which modem is in use:

- X.28 Radio Pad
- “AT” Modem

Then what type of dialling you would like to use: **(Utilogs Only)**

- Dial even if no dial tone
- Use pulse dialling

Then which timing is going to be in use:

- UK pulse dial timing (67/33)
- US + Canada timing (61/39)

What type of answer tone is in use:

- Use 2100HZ answer tone
- Use guard tone in answer mode

Then what HZ tone is in use:

- 1800HZ Guard Tone
- 500HZ Guard Tone

Auto Answer Configuration (Utilogs Only) – This allows you to set the auto answer configuration that you would like the logger to use:

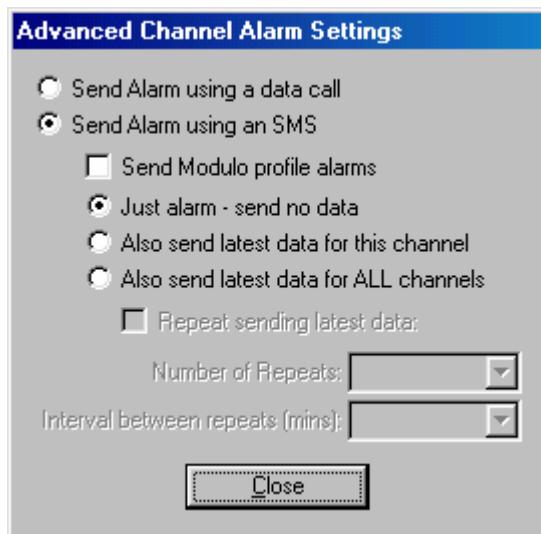
- **Number of rings before answer** – use the drag down box to select.
- **The length of the answer window** – use the **(up and down)** arrows to set the **Start** and **End** time.

Dial Out Retry Mode (All logger Types) - This allows you to set the Dial retry mode you would like the logger to use:

- Single Sequence
- Repeat every 2 hours

Close - This closes the window and saves the changes made to the screen.

8.6.2 ALARM CONFIGURATION - ADVANCED SETTINGS



Select either:

- Send alarm using a data call
- Send alarm using an SMS

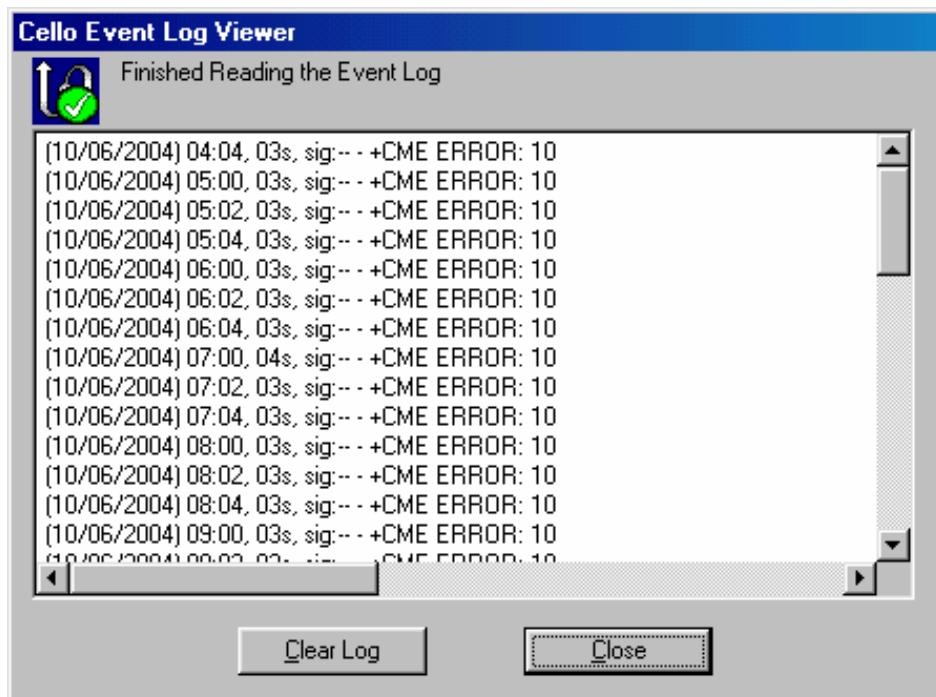
When using SMS you have a choice of:

- Send Modulo profile alarms (if the Cello is part of a control system).
- Just alarm – send no data
- Also send latest data for this channel
- Also send latest data for ALL channels

If you would like the unit to repeat sending latest data put a (tick) in the box.

If you have selected to repeat sending latest data, use the drop down boxes to set the **Number of repeats** and the **Interval between the repeats (mins)** and then click the **Close** button.

8.7 Cello Event Log



The **Event Log** allows you to view all of the events that have been logged by the Cello.

This window is for advanced use to diagnose GSM network problems. The information in the log is useful to Technolog so it should only be cleared if not needed.

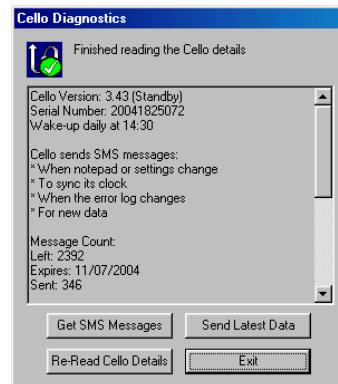
The log shows the **date/time/signal strength and status** for each event.

You have the opportunity to **Clear** the log by clicking on the **Clear Log** button at the bottom of the window. This will update the attached logger's memory.

Click **Close** to close the window.

8.8 Cello Diagnostics

This window allows you to view useful Cello information that is often used for installation and maintenance.



Get SMS Messages

By clicking on Get SMS messages, the unit will wake up and automatically start listening for any incoming messages for new instructions and updates.

The window will show the communications progress and will show errors or received messages in easy-to-view form.



Send Latest Data

By clicking on Send Latest Data, the unit will wake up and automatically send any data that has been recorded up to this period directly to PMAC for reading

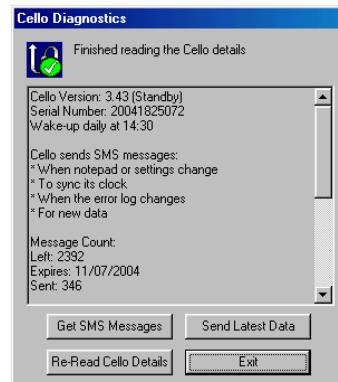
The window will show the communications progress and will show errors or received messages in easy-to-view form.



Re-Read Cello Details

This function allows you to re-read all of the unit details and shows an up-to-date list giving you a more accurate view of the diagnostics.

There are 2 pages of information so use the scroll bar on the right to see all of the cello settings.



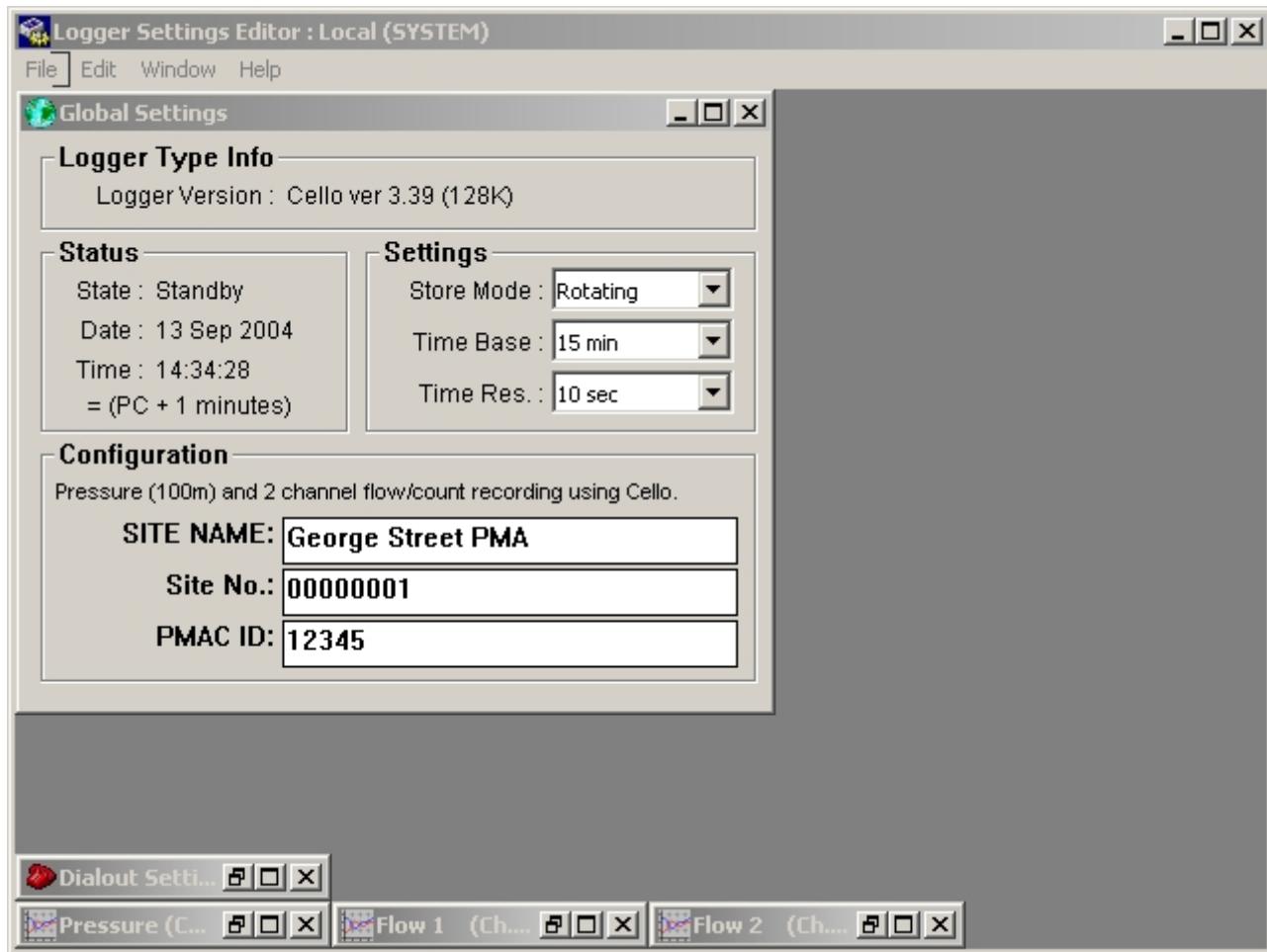
8.9 Download LGR File (Logger Settings Editor)

PMAC Lite will display the window shown below whilst it downloads the current Logger settings.

When the above has been completed, the logger settings editor will be displayed as shown below.

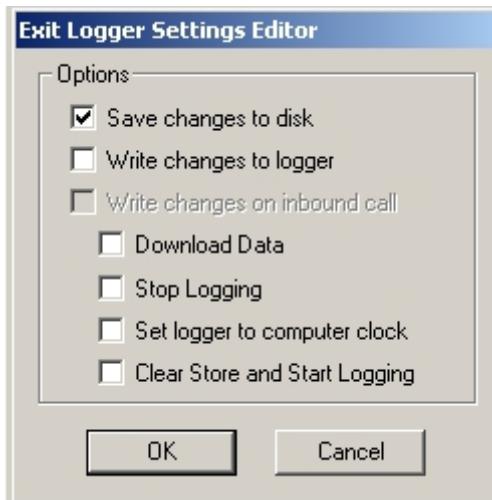
All of these settings are available through other setup screens.

The settings options may be altered at this point. This is carried out in the usual window manner, by clicking the option boxes down arrow and selecting the required option by clicking on it with the mouse pointer.

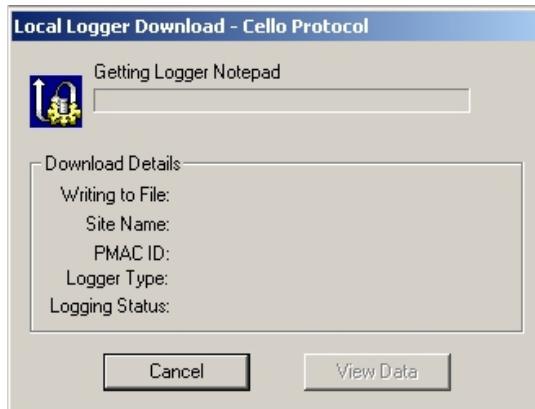


When all the required alterations to each tiled window have been made, i.e. each channel, dialout settings and the global settings window, the logger settings editor can be closed in the usual windows fashion by clicking on the cross in the right hand corner of the logger settings editor window. The options menu shown below will now appear.

This is the point at which all of the previous changes made using the logger settings editor will be stored. Using the mouse pointer, click on the **Write Changes to Logger** check box. This will insert a tick in the box (it may also "tick" other boxes. If you wish to change these, just re-click on them to "set" or "reset" the option). Finally, "click" on the **OK** button.



This will be followed by the updating logger window.



The updating will then be complete and communications will finish.

At this point the logger is now set with the required channel names (descriptions), scaling, site name and PMAC ID. Please note that the PMAC ID field is only required if you are going to subsequently use PMAC Plus software with the datalogger in question.

Other Menus

Reset Logger allows the ID of an E5565 protocol logger to be permanently set, and resets the logger. This only works with E5565 protocol loggers e.g. Newlog4, Autowat 4.

Help brings up the PMAC Lite communications help window.

About tells you the version number of the PMAC Lite Communications Module. This information may be helpful if you are having problems with local communications using PMAC Lite.

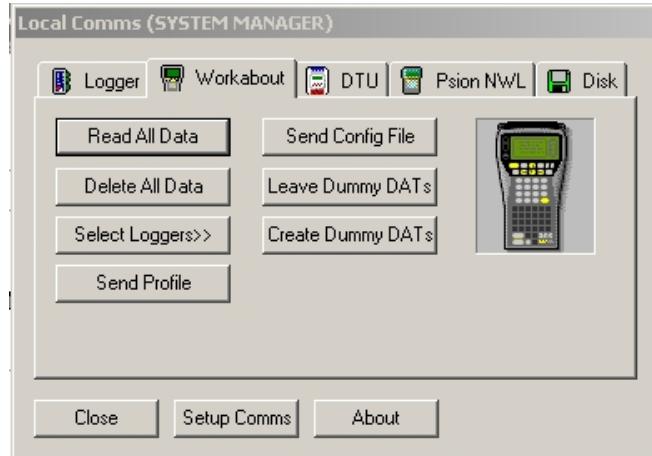
Download from a Psion Workabout

This page allows communication with a Psion Workabout running Dragons. It allows the downloading of DAT files and the creation of Dummy DATs as well as the uploading of configuration files. Reception of NWL files is done with the **Psion NWL** page.

To enable this page, the Workabout page must be set up in the Comms Setup window. If the Workabout is to be connected to the PC on COM1 or COM2, then the setting can be left at Auto, which is recommended. Otherwise select one of the other settings. Using the "None" option will disable Workabout Comms.

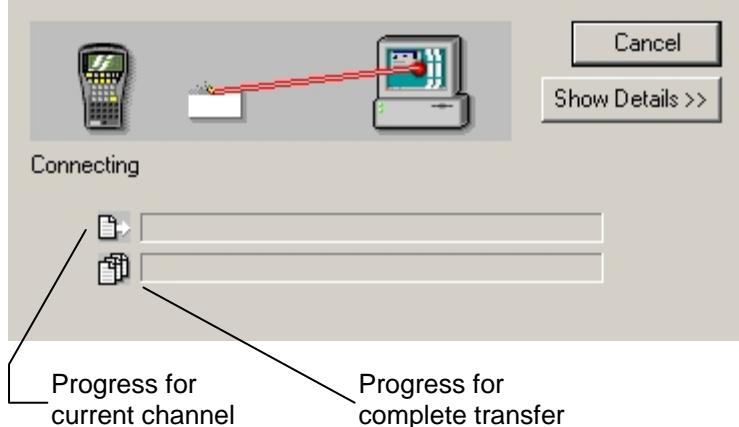
Ensure that the **Remote Link** settings on the Workabout are correct before downloading (Refer to the Dragons User Guide for further information).

- Connect the Psion Workabout to the PC.
- Open the **Local Comms** window (right) and click on the **Workabout** tab.
- Either:
 - Click on **Select Loggers** if the data from several loggers is stored, select the required one(s) and then click on **Read**, or
 - Click on **Read All Data**.



- The **Read Data from Workabout** window (right) appears and displays the progress of the download.

Click on **Show Details** if further information is required. This includes Site Name, PMAC ID and Status.



- An on-screen report is generated when the transfer is complete.

Workabout Window Options

READ ALL DATA

Reads all the data from the Workabout and stores it in PMAC. Entries will be created in the site database if they do not already exist and Logger files will be created and updated as necessary.

When **Select Loggers** is selected, this button changes to a **Read** button which enables data to be read from a selected logger or loggers and stored in PMAC.

Note: The data files used can be on any of the Workabout packs (Solid State Disks - SSDs) – they will be found automatically.

DELETE ALL DATA

Deletes all logger entries and data from the Workabout.

When **Select Loggers** is selected, this button changes to a **Delete** button, which enables data from a selected logger or loggers to be deleted from the Workabout.

SELECT LOGGERS >>

Interrogates the Workabout and then displays a list of the loggers whose data it holds.

SEND CONFIG FILE

Allows a configuration file, supplied separately to PMAC, to be uploaded onto the Workabout in order that it can be used with Dragons.

LEAVE DUMMY DATS

Deletes all data from the Workabout but leaves a small element of a data file, which contains the date/time of the most recent data stored on the PC for that file. This then allows Dragons to only download the latest data required from a logger. Hence reducing download time. See below for details of Dummy DATs.

CREATE DUMMY DATS

Allows Dummy DAT files to be created from scratch on the Workabout. See below for details of Dummy DATs.

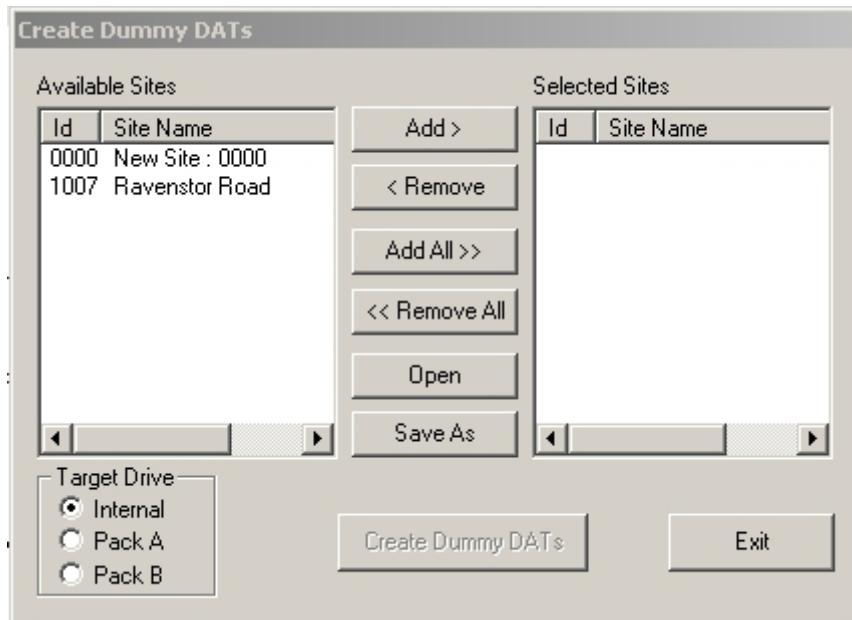
Dummy DAT Files for Dragons on the Psion Workabout

Dummy DAT files are a way of ensuring that, when using Dragons to read data from a logger, only the required data is read from that logger rather than all data on the logger. This will decrease read time considerably in most circumstances, and also enables more loggers to be read before the data must be transferred to PMAC because less memory is needed for each site.

To use the system, after reading data from a Workabout, instead of clicking on **Delete Data** or **Delete All Data**, click on **Leave Dummy DATs**. This will delete the data from the Workabout but leave a data-file element for each channel containing the end time of the data.

It is also possible to create the dummy DATs on a new Workabout, before going to the sites. This would normally only be done once per Workabout.

To do this, click on the **Create Dummy DATs** button. The **Create Dummy DATs** window (below) is displayed.



Select the sites that are needed as dummy DATs and move them into the **Selected Sites** list using the **Add>** and **Add All>>** buttons.

Once the sites are in the **Selected Sites** list, click on **Create Dummy DATs** to contact the Psion Workabout and create the dummy DATs on the Pack selected in the **Target Drive** box.

Click on **Save As** to save a set of sites to disk; this can be retrieved when required using the **Open** button. The lists can be sorted by clicking on the column headers. Using this system, pre-defined 'Retrieval runs' can be created and added to work lists when required.

Download from a DTU

This page allows access to a Datamaster or RUS Data Transfer Unit (DTU), connected directly to a communication port on the PC by an appropriate cable.

Connection is via the same COM port used for Logger connection, but the E5565 protocol must have been installed with PMAC Plus.

Note: If a Datamaster is being used then ensure the display is on before commencing any download otherwise download cannot be achieved.

- Connect the DTU to the PC and press any key on the Datamaster.

- Open the **Local Comms** window (right) and click on the **DTU** tab.

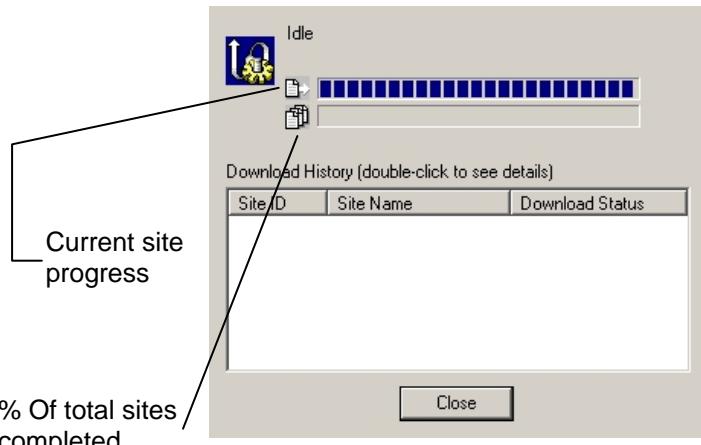
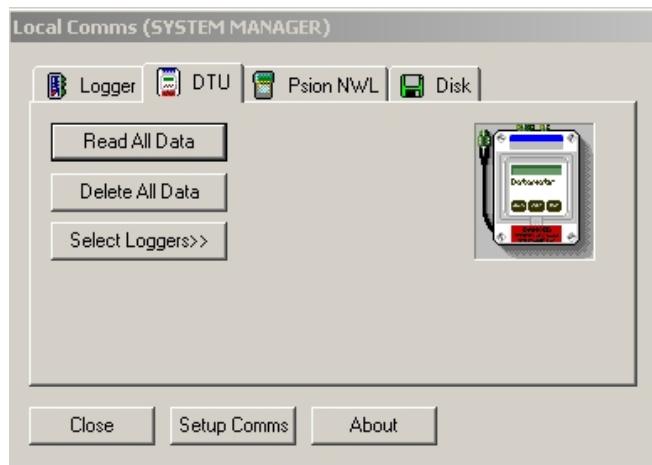
- Either:

Click on **Select Loggers** if the data from several loggers is stored, select the required one(s) and then click on **Read**, or

Click on **Read All Data**.

- The **Datamaster Data Download** window (right) appears and displays the progress of the download.

Click on **Show Details** if further information is required. This includes Site Name, Site ID and Download Status. Double clicking on an entry in the **Details** box displays more information about that site's transfer.



The window remains on display to enable transfer status to be viewed until **Close** is selected.

DTU Window Options

READ ALL DATA

Reads all the data from the DTU and stores it in PMAC. Entries will be created in the site database if they do not already exist and Logger files will be created and updated as necessary.

When **Select Loggers** is selected, this button changes to a **Read** button which enables data to be read from a selected logger or loggers and stored in PMAC.

DELETE ALL DATA

Deletes all logger entries and data from the DTU.

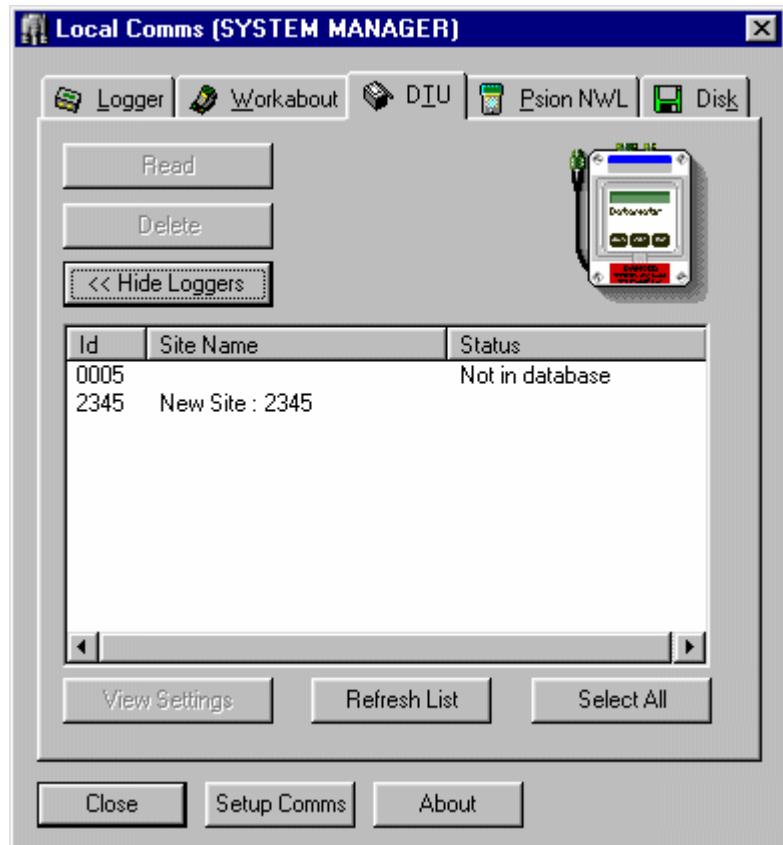
When **Select Loggers** is selected, this button changes to a **Delete** button, which enables data from a selected logger or loggers to be deleted from the DTU.

SELECT LOGGERS >>

Interrogates the DTU and then displays a list of the loggers that are on it, as shown in the example below. Individual sites can be downloaded and deleted using the **Read** and **Delete** buttons.

The **View Settings** button will display the logger settings for the selected logger. These settings are those historically recorded by the DTU and hence cannot be modified and written back.

When **Select Loggers** is selected, this button changes to a **Hide Loggers** button, which returns the display to the **Local Comms** window as shown on the previous page.



Psion II / Workabout NWL File Download

This page allows GPS Protocol data files (.NWL files) to be received from a Psion Organiser II running GPS or a Workabout running Dragons. It also allows configuration files to be sent to a Psion Organiser II.

To enable this page, the Psion NWL page must be set up in the Comms Setup window.

- Connect the equipment to the PC.
- Open the **Local Comms** window (right) and click on the **Psion NWL** tab.
- Click on Receive Data.

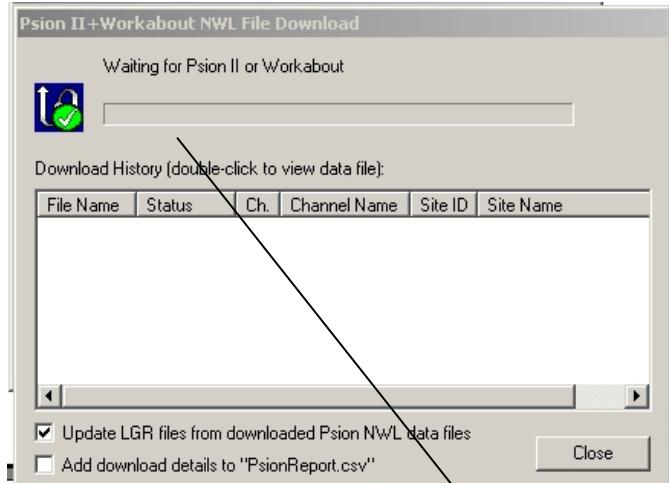


- The **Psion II + Workabout NWL File Download** window (right) appears and displays the progress of the download.

Note: At this point, you must initiate the transfer of files from the Psion. The method used for this will depend on the type of Psion in use.

Click on **Show Details** if further information is required. This includes File Name, Status, Channel, Channel name, Site ID and Site Name. Double clicking on an entry in the **Details** box displays more information about that site's transfer.

The window remains on display to enable transfer status to be viewed until **Close** is selected.



Download progress

NWL Window Options

RECEIVED DATA

Puts the **Local Comms** module into a mode where it is waiting for data to be sent to it from the other device.

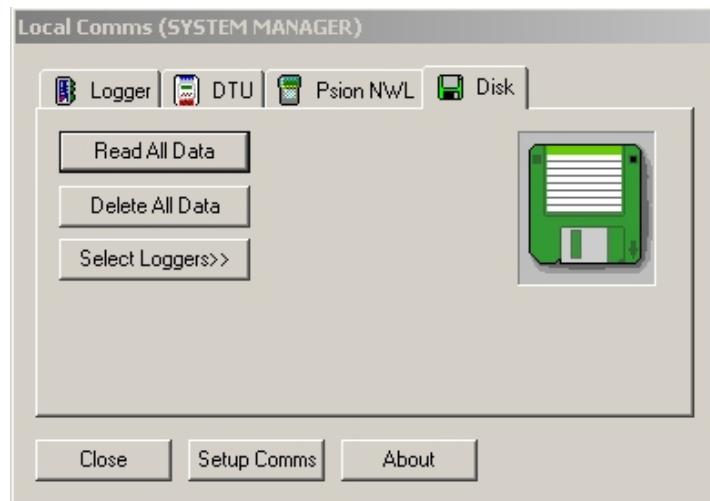
SEND CONFIG FILE

Sends a configuration file supplied separately to PMAC to the attached Psion Organiser II.

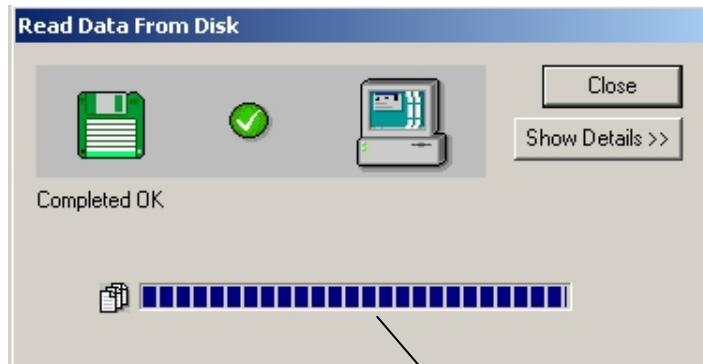
Download from Disk

This page allows data and logger files to be loaded into PMAC from a floppy or hard disk or across a network.

- Insert the floppy disk into the PC disk drive, connect the hard disk, or establish the network connection, as applicable.
- When the **Local Comms** window appears (right), click on the **Disk** tab.
- Either:
 - Click on **Select Loggers** if the data from several loggers is stored, select the required one(s) and click on **Read**, or
 - Click on **Read All Data**.
- Select the drive to import data from and click on **OK**.



- The **Read Data from Disk** window (right) appears and displays the progress of the download. Click on **Show Details** if further information is required. This includes ID, Site Name and Status. Double clicking on an entry in the **Details** box displays more information about that site's transfer.



The window remains on display to enable transfer status to be viewed until **Close** is selected.

Disk Window Options

READ ALL DATA

Reads all the data from the disk or network file and stores it in PMAC. Entries will be created in the site database if they do not already exist and Logger files will be created and updated as necessary.

When **Select Loggers** is selected, this button changes to a **Read** button which enables data to be read from a selected logger or loggers and stored in PMAC.

DELETE ALL DATA

Deletes all logger entries and data from the disk or network file.

When **Select Loggers** is selected, this button changes to a **Delete** button, which enables data from a selected logger or loggers to be deleted from the disk or network file.

SELECT LOGGERS >>

Interrogates the disk or network file and then displays a list of the loggers that are on it. This is similar to the DTU display above.

Automatic Remote Data Retrieval

When the PC is equipped with a modem, or modems, PMAC Plus can be configured to download data automatically from any sites where the logger is connected to a telephone line. For further information, refer to **Section 5 Using the Site Database** as follows:

- **Creating a New Site** - includes information on entering a logger telephone number and communication protocol when appropriate as each site is created on the database.
- **Changing Autopoll Settings** - covers setting a polling frequency and the available polling option for each site.
- **Changing Global Autopoll Settings** - describes the global polling settings, which apply to all remote data retrieval sites. The options include the start time for daily polling activity, the number of retries allowed and the option to delay retry for failed sites until completion of all other polling activity. It also enables failed sites to be suspended and removed from future polls until the suspension is cleared manually.

Manual Remote Data Retrieval

When the most recent data is required from a remote data retrieval site, a manual update can be selected using either the LINE - UPDATE DATA menu options in the **Graph** window or the UTILS - MANUAL POLL menu options in the **PMAC Plus** window as follows:

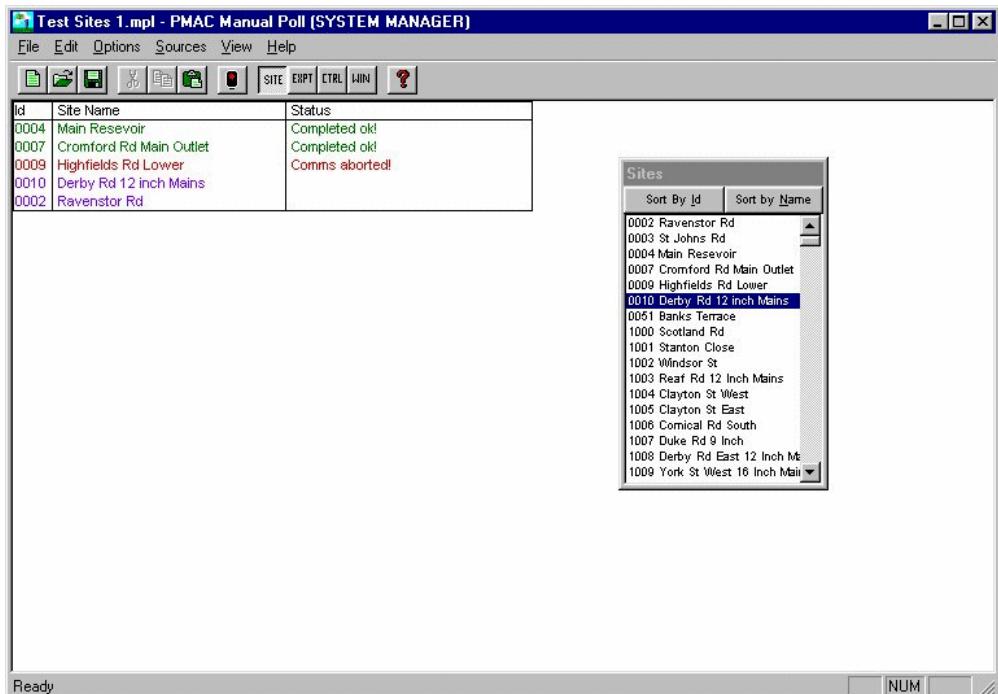
To Update Data from a Specific Site

1. Obtain a data graph for the site - see **7 Graphs and Values - Graphs**.
2. From the LINE menu select UPDATE DATA. PMAC Plus will automatically contact the logger on that site and retrieve as much new data as possible, updating the graph as the data is downloaded.

Manual Poll

In certain circumstances there may be the need to obtain vast quantities of data from a number of sites. If the user was to download each site individually then this may take a large amount of their time and be a very tedious task. A more feasible way to download data from these sites is to use the Manual Poll Program.

Available from the Utils Menu from the main window this function can only be used by users with normal or system access.



The first step to using the Manual Poll is either creating a new file or loading an existing file. This can be achieved by using the **File** command from the Menu Bar or selecting an appropriate icon.



EDIT

After creating an appropriate file or loading an existing file then there may be alterations you wish to perform to the list by removing some of the files or adding others. Using the Edit command from the Menu Bar or using the icons you can cut out sites, copy them and then paste them to a new file.



OPTIONS

Once the file has been created or loaded and all amendments made to the list, you will be at the stage of activating the list. Selecting **Options – Activate** or simply clicking on the traffic light icon will start the processing.



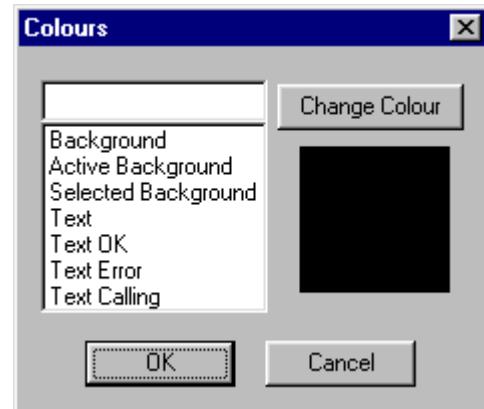
Another feature available is the clearing of errors that may occur during the polling process. To clear these them select **Options – Clear Errors**. If there are no errors currently within the list then this option will be blanked out.

The third feature available in the options selection (Only available with E5565 protocol loggers) allows the user to synchronise the clock in the logger to the clock on the PC. This can be done by clicking on the **Option – Synchronise Clock** and this will place a tick mark next to this option.

Note: If the time difference is greater than the logging rate then previous data points may be replaced or succeeding data points may be missed.

The fourth feature available allows the PC to receive an up to date version of the .lgr file. The file may have been modified by another PC using remote comms or by using a local comms instrument. To activate this feature click on **Option – Update LGR**.

The last feature may be important if the user wishes to define the colours used for the different areas of the processing of the manual poll. The user can define colours of different areas of the screen from the colour of text, titles and backgrounds.



SOURCES

There is a choice of four different lists that sites can be obtained from.

They are: -

- Site List
- Exception Group
- Control Group
- Windows



Once a site has been found on the appropriate list than the user needs to highlight the site and drag it to the main list or double click on the option.

VIEW

On the Manual poll screen there is a tool bar located at the top of the screen which contains the buttons and at the bottom of the screen there is the status bar. These can be added or removed from the screen by ticking the option at the side of each.

HELP

This option gives the user access to About Pmanpoll, which allows the user information to the version of this software module. Another way to access this is by double clicking on the question mark icon. This information should be noted if any problems occur and relayed to any person contacted at Technolog.



9 Graphs and Values

Graphs

The default format for displaying site data within PMAC Plus is as a graph.

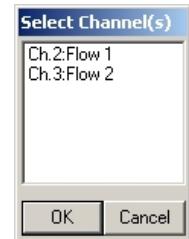
Opening the Graph Program from PMAC Plus

To run the Graph program from within the PMAC Plus program, either:

- select the required site in the **Site Database** window and:
 - select TOOLS - GRAPH from the menu bar, or
 - click on  in the tool bar.
- from a graphical interface, select **View** from the task list for the required site.

If there is only one data channel available at the selected site, the Graph program will open and display a Graph window with a graph showing the data from the selected site - See **The Graph Window**, later in this section.

If several data channels are available, a **Select Channel** window (right) will open first to allow you to select the required channel. Select the required channel and click on **OK** to open the Graph program with the selected channel data displayed.



Opening the Graph Program Outside PMAC Plus

The Graph program can also be run as a stand-alone program without the PMAC Plus program being open. In this case, as a specific site has not already been selected, you have to select the data to display as a graph.

You can run the Graph program in this way by:

- locating the graph program file (graph.exe) in Windows Explorer or any similar utility program and double clicking on it, or
- by clicking on a (previously created) shortcut on the Windows desktop, or
- by running it from a command line such as the Run command in the Windows Start menu.

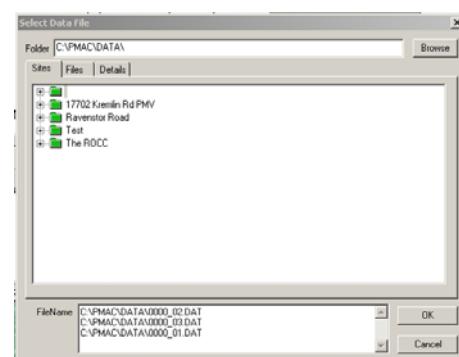
When any one of these methods is used to open the Graph program, a **Select Data File** window (right) is displayed.

Click on the **Site** tab and select the site from which you wish to view data from the list of available sites.

Click on the **Files** tab and select the data file you wish to view.

If several data channels are available, click on the **Details** tab and select the required channel to display.

The Graph program will then open with the selected data displayed - See **The Graph Window**, later in this section.

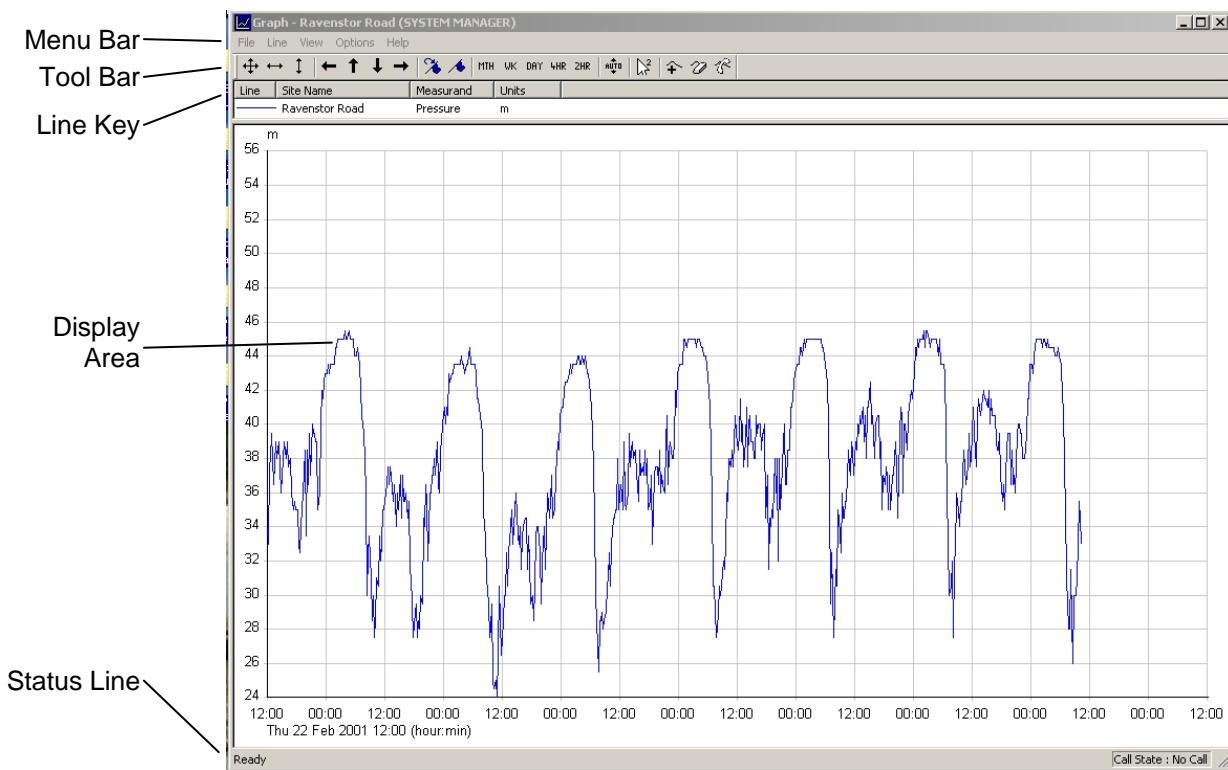


Opening a Graph Outside PMAC Plus

There is another way to view a graph of a .nwl or .dat file. Simply locate a file using Windows Explorer and double clicking on the selected file. The graph of the file should appear but with limited access to functions available within the Graph program. This is a more convenient method if just wishing to view an individual file.

Note: Files can only be graphed on machines that currently have PMAC installed on them.

The Graph Window



The **Graph** window is split into five main parts:

- **Menu bar**
- **Tool bar** This is detachable and can be dragged to either side, or to the bottom, or can be floating.
- **Line key** This is used to control the appearance of individual items in the display area. If a line is selected, right clicking with the mouse opens a Line menu to provide immediate access to Line functions.
- **Display area** This is where data is displayed as a graph or summary. Right-clicking here produces a menu of options for changing the view of the data.
- **Status line**

Summary Display

In addition to displaying the data as recorded, PMAC Plus can display a summarised data table for a selected line. Refer to **Lines - Line Settings** below.

Menu Bar Options

Notes:

1. Some menu bar functions may not be available to you if you have Normal Operator or Casual Operator access.
2. Some menu functions are also available from the Tool Bar – see **Tool Bar Options** later in this section.

FILE MENU

New (Ctrl + N)	Creates a new, blank PMAC graph document.
Open (Ctrl + O)	Opens a saved PMAC graph (.pmg format).
Save (Ctrl + S)	Saves the current displayed PMAC graph (.pmg format)..
Save As	Saves the current displayed PMAC graph (.pmg format) with a different name and into a different directory if required.
Copy	Copies the current displayed graph for pasting into another document – e.g. Word, Wordpad etc.
Print	Prints the current displayed graph.
Print Preview	Displays a preview of the page to be printed.
Print Setup	Enables printer selection and set up.
Recent File	Lists recently accessed files.
Exit	Closes the Graph program.

LINE MENU

(Applicable to a line currently selected in the Line Key)

Settings...	Opens the Line Settings window. Enables setting of line style and colour, units, line type, summary options, line lock, information display and links between data files (to form a single file). See Lines – Line Settings , later in this section for further detail.
Update Data	Allows you to request a one-off download of the most recent data available at the site at the time of the request. Only applicable to sites connected to the telephone line.
Continuous Update Data	Allows you to request continuous download of new data from a site as it is recorded. Only applicable to sites connected to the telephone line.
Abort Comms	Cancels communication activity.
Add Statistical Line...	Displays either a mean, maximum, minimum or standard deviation line as required (only if data is available).
Add Line...	Adds another data line to the current graph from the file.
Duplicate Line	Duplicates a selected line, which is shown in a different colour.

Hide Line	Hides a selected line - line is shown with superimposed X in the Line key.
Remove Line	(or Delete key) Removes a selected line.
Define Columns...	Enables columns to be added to or removed from information display in the Line Key. Also enables lines to be moved and/or saved as defaults.
Add Info Column	Adds "Value at Pointer" column to information display - shows value of data at the mouse position. Mouse position time is shown on the status bar.
Values	Opens the Values window with data for selected line displayed as a table of values.
Export	Opens the Export Options window - enables configuration of selected data into .CSV format for export either to a file or to the Windows Clipboard.
Break File	Enables division of current data file into two (newer and older) data files from a set date and time.
Edit Calculation	Opens the Edit Calculation window - enables the performance of calculations, which may include data from other data files and/or appropriate constants.
Summarise	Opens the Summarise window, which shows average, highest, lowest and total values over a defined summary period.
FlowDist	Selecting this function allows you to view flow data in a bar chart form.

VIEW MENU

Zoom Out	Increases the range of the X-axis, Y-axis or both axes (graph is made smaller in the selected axis or axes)
Move	Moves the display left, right up or down as required.
Time Scale	Enables time scale unit to be set as month, week, day, 4 hours or 2 hours.
Divisions	Provides the following options: Add Time Division (Ctrl + 1) Remove Time Division (Ctrl + 2) Add Y Division (Ctrl + 3) Remove Y Division (Ctrl + 4)
Small Expansion	Expands the time (F3) or Y-axis (+) by one factor (i.e. time scale from day to week).
Small Compression	Compresses the time (F4) or Y-axis (-) by one factor (i.e. time scale from week to day).
Bookmark	
Set	Temporarily stores the present program settings (i.e. the X-axis and Y-axis scales).
Recall	Recalls program settings temporarily stored by the Set command (above). This function is particularly useful if you wish to take a close look at a data point then return to a broader view.
Autoscale Y-Axis	Automatically scales Y-axis to best fit in window for current data.
Zoom On	Enables zoom (decreases range of selected axis - graph is made bigger) on Left axis, Right axis or Both axes.
Division Resolution	Enables resolution to be changed to Low, Medium or High as required for optimum reproduction on your printer.

Annotate Generates vertical or horizontal annotation boxes - text can be inserted or edited and boxes can be re-positioned as required. See **Annotations**, later in this section for further detail.

OPTIONS MENU

Set Range... Enables definition of display start time, time range and Y-axis range as required.

Set Title Enables editing of window title – the title is included in any print out.

Copy Graph to Clipboard Copies graph to clipboard for pasting into Template editor or Profile Editor.

Start-up Settings... Defines start-up time range and toggles auto scaling of data on or off.

HELP MENU

Index Access to on-line help.

About Graph... Displays the **About Graph** window.

Tool Bar Options

Note: Some tool bar functions may not be available to you if you have Normal Operator or Casual Operator access.

-  **Zoom Out** - increases the range of the X and Y-axes (graph is made smaller in both axes).
-  **Zoom Out X** - increases the range of the X-axis (graph is made smaller in the X-axis).
-  **Zoom Out Y** - increases the range of the Y-axis (graph is made smaller in the Y-axis).
-  **Left** - moves the display left.
-  **Up** - moves the display up.
-  **Down** - moves the display down.
-  **Right** - moves the display right.
-  **Recall** - recalls program settings temporarily stored by the **Set** command (below). This function is particularly useful if you wish to take a close look at a data point then return to a broader view.
-  **Set** - temporarily stores the present program settings (i.e. the X-axis and Y-axis scales).
-  **Month** - sets time scale unit to month.
-  **Week** - sets time scale unit to week.
-  **Day** - sets time scale unit to day.
-  **4 Hour** - sets time scale unit to hours in 4 hour steps.
-  **2 Hour** - sets time scale unit to hours in 2 hour steps.
-  **Autoscale Y-Axis** - automatically scales the Y-axis to best fit in window for current data.
-  **Show Value at Pointer** - adds "Value at Pointer" column to information display - shows value of data at the mouse position. Mouse position time is shown on the status bar.
-  **Add Line(s)** - adds another data line to the current graph.
-  **Remove Line** - removes a selected line.
-  **Update Data** - allows you to request the most recent data from the site. Only applicable to sites connected to the telephone line.

Moving Around Graphs

Use the following buttons to move around a displayed graph:

Button	Key	Action
	Left cursor Shift+Left cursor	moves graph one division left. moves graph one full width left.
	Right cursor Shift+Right cursor	moves graph one division right. moves graph one full width right.
	Up cursor Shift+Up cursor	moves graph one division up. moves graph one full height up
	Down cursor Shift+Down cursor	moves graph one division down. moves graph one full height down

Zooming in and Out

Zoom In

To zoom into a graph, move the mouse cursor to one corner of the area to be enlarged in the display area. Press and hold the left mouse button and drag a box to enclose the required area and release the button. The selected area will be enlarged to fill the display area.

Zoom Out

There are a number of methods with which can be used to zoom out of graphs, as follows:

Click on the appropriate **Zoom Out**  button or select ZOOM OUT from the VIEW menu and select the required option.

Zoom Back

Click on the **Recall**  button or select SET STATE - RECALL from the VIEW menu to zoom back to the last set range - see VIEW -SET STATE in **Menu Bar Options** above and Set in **Tool Bar Options** above. If a range has not been set, the graph will revert to the defaults used when it was first opened.

Setting Ranges

The SET RANGE option in the OPTIONS menu enables the following display range parameters to be configured.

Start Time

Enables start time and date (i.e. the time at the origin of the graph) to be set.

Time Range

Enables definition of the amount of data to be displayed.

First, define the division size, i.e. hour, day, month, etc. Then define the number of divisions. For example, setting "day" and "4" defines a covered range of 4 days.

Y Range

Enables the scaling of the Y-axis to be set by entering the required start and end values.

Note: If more than one measurand is being displayed, then it is possible to enter separate scaling for each Y-axis.

Setting to Standard Ranges

In the tool-bar there are a number of buttons, which are used to set the size of the time axis divisions, as follows:



- or keyboard **M** sets time scale unit to month.
- or keyboard **W** sets time scale unit to week.
- or keyboard **D** sets time scale unit to day.
- or keyboard **4** sets time scale unit to hours in 4 hour steps.
- or keyboard **2** sets time scale unit to hours in 2 hour steps.

Increasing/Decreasing the X-Axis

A quick way to increase or decrease the X-axis is by using the **F3** or **F4** keys. **F3** will decrease the scaling while **F4** will increase. These changes are made in smaller steps compared to the Standard Ranges.

Auto-Scaling the Y-Axis

To set the Y-axis to the best possible fit for the data which is currently being displayed, either:

- click on the **Autoscale Y-Axis**  button, or
- select AUTOSCALE Y AXIS from the VIEW menu

The program scans the currently viewed page of data and scales the Y-axis to display all data points.

Lines

Line Key

The line key (located immediately below the tool bar) shows all lines used in the display and indicates what each line colour represents. Right clicking on a line displays a menu of options for that line - see **Line Settings**, below.

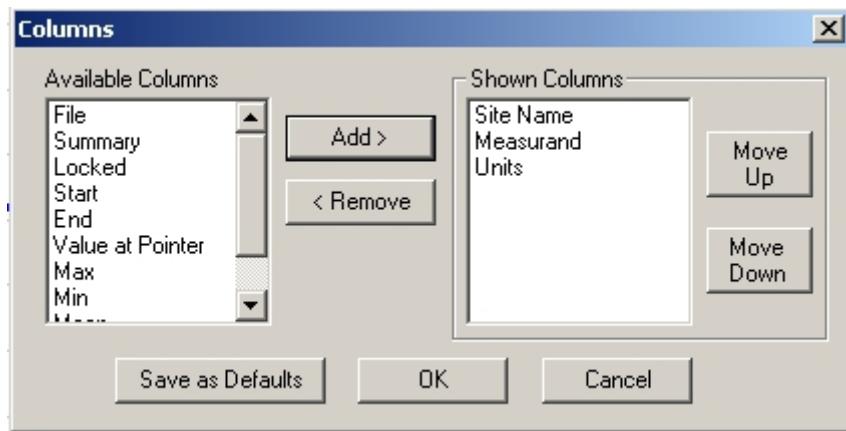
The key also provides additional information not shown in the display area. The information topics displayed can be configured using the **DEFINE COLUMNS** option in the **LINE** menu.

Defining Column Information

Line	Site Name	Measurand	Units	File	Start	End
—	New Site : 0500	Channel 1	pulse/hr	C:\PMAC\...	09:11:47 5 Apr 2000	09:12:23 5 Apr 2000

There may be applications where more accurate details are required to define the data obtained. Using the define columns function will allow the user to add a greater understanding to the graph and its data. Below is the list of possible columns that can be added.

Note: If too many of the options below are used then the scroll bar will appear viewing all the defined columns may be difficult.



Individual column widths can be changed as required by clicking and dragging the heading.

Dragging the headings can change the column widths and right clicking on a line will allow display a menu of options for that line.

Line Settings

To re-configure Line Settings, either:

- right-click on a line in the line key, or
- select the line in the Line Key and then select SETTINGS from the LINE menu to display the SETTINGS menu.

This provides access to the following options:

LINE STYLE

This enables the colour and format of the line to be set by selecting from the available options. A sample of the line is also displayed.

Note: Dotted and dashed lines are particularly useful when printing multiple lines of data on a monochrome printer.

UNITS

This enables data to be displayed in units other than those in which it was originally recorded. Select the new unit from the available options.

Notes

1. Not all unit conversions are available; PMAC Plus will only display those that are.
2. User-defined conversions can be added.
3. It is not possible to change the units stored in the file.



SAVING A LINE TYPE

After a user has modified the line type they may wish to save the setting. Selecting LINE TYPE tab from the line setting menu can do this. When the user has reached this screen they should select the CREATE NEW button. A second window will appear allowing the user to select a name for the line type.

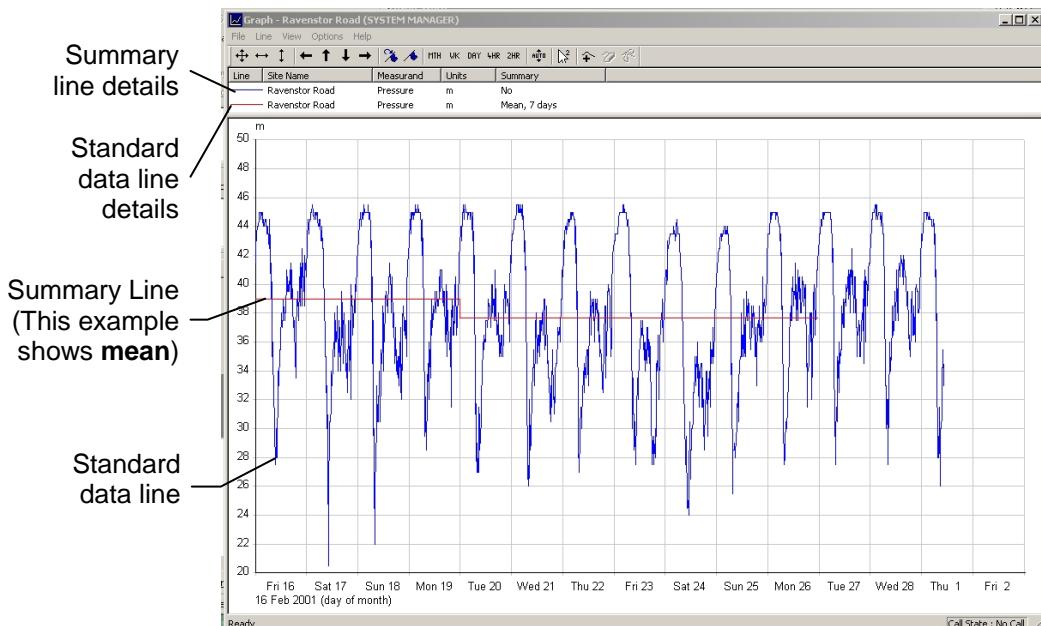
When the user has entered the name required then select OK. To save all the changes made then select SAVE from the Line Settings Window.



SUMMARY

In addition to displaying the data as recorded, PMAC Plus can display a summary line for a selected line.

The **Period**, **Day Start** and **Type** of summary must be selected. Available summary types are **Total**, **Mean**, **Maximum** or **Minimum**; when appropriate, **Standard Deviation** is also available. Selecting **Duplicate** alongside the chosen type will generate a new line on the graph to display the selected summary data.



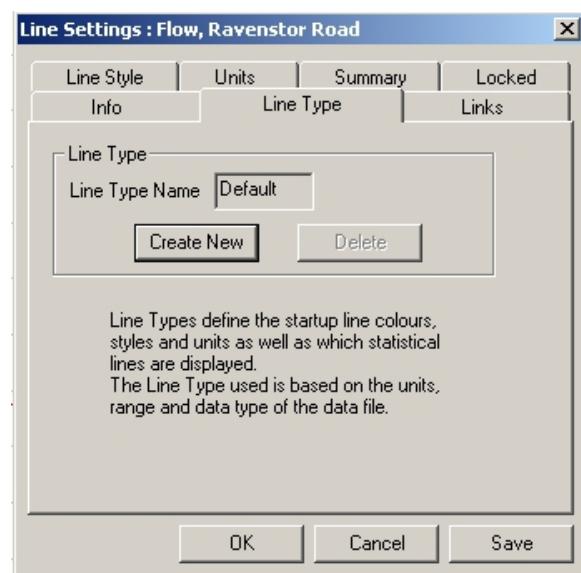
INFO

The **Info** tab displays a list of additional information about the data file. An operator does not normally require the displayed information.

LINE TYPE

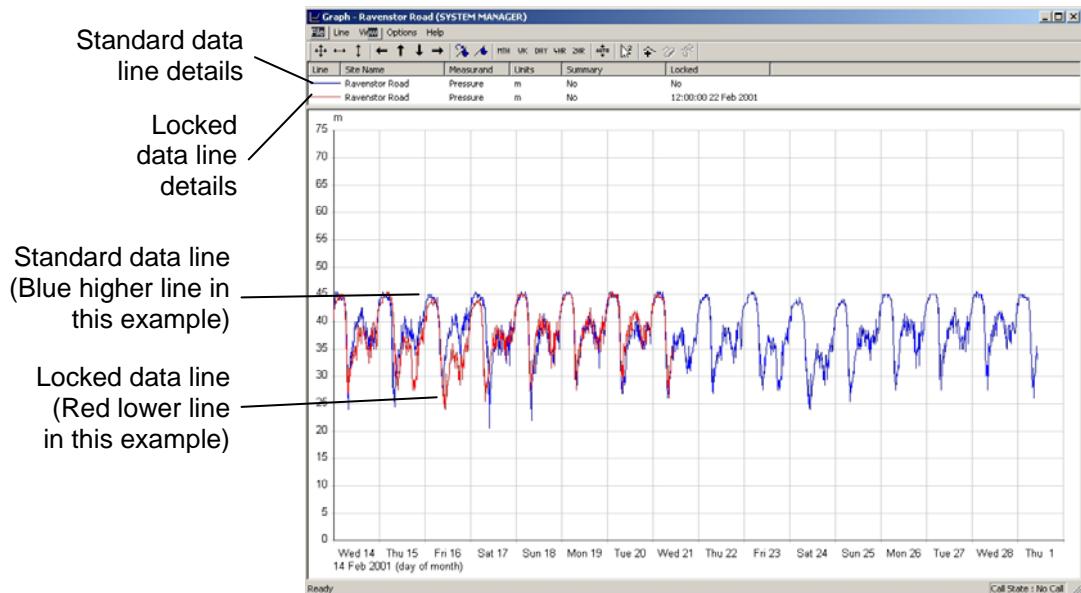
The **Line Type** option enables you to group together common classes of lines, depending on the input parameter. Having done this, it makes it a simple matter to modify the display of all lines within a class at the same time.

For example, you may initially decide to show all inlet pressures in red and all outlet pressures in blue. If all lines within each parameter are grouped, the colour of all inlet pressure lines can then be changed to black at the same time if required.



LOCKED

This feature allows you to Lock (i.e. freeze) the position of a line for a given time period, to allow data from one time period to be compared with another. For example, a displayed week of data could be locked, and then the display could be moved to show a different time period - the locked display is still displayed (in a contrasting colour) - allowing the data for the two periods to be compared directly on-screen.



By default the locked time and date will be that currently displayed, however you may choose alternative times and dates using the controls available.

The **Duplicate** option creates a new, locked line and keeps the original.

Note: Locked lines are scaled on the Y-axis in the usual way.

LINKS

This option enables several data files to be joined together and displayed as a single line or saved as a single file. The files may be in .NWL or .DAT format, and the two formats may be mixed.

For each linked file, PMAC displays the file name, the priority, the period for which data is available and any possible errors; some error may occur when linking files because of different resolutions, PMAC Plus attempts to indicate the worst possible error.

When a LNK is being displayed, the files are searched for data from the highest priority to the lowest. Where data is missing in one file and a file of a lower priority available for that period, it will fill the gap with the lower priority data.

It is important that the highest priority file of a set of linked files is the most recent DAT file to ensure that scaling information is preserved when data is downloaded at a later date.

The options available are as follows:

- Add Allows a link to another file to be included
- Remove Allows a link to another file to be removed
- Create DAT Consolidates all linked files into a single DAT file
- Save LNK Saves link information for future use in the form of a .LNK file. This file just contains pointers to the files included. It can be displayed as a graph, but if any files are missing or have been moved, it will not display.
- Up Increase priority of a selected link
- Down Decrease priority of a selected link

Moving Lines from the Line Key

Lines from a graph Line Key can be dragged onto other graphs and also on to the desktop or into another folder. Dragging into a folder or on to the desktop will copy the file.

Data files (.DAT or .NWL), .SUM files, .LNK files and .PMG files can also be dragged from a folder or the desktop onto a graph.

Annotations

To add a horizontal or vertical annotation to a graph, either:

- right-click on the graph and select ANNOTATE and then select VERTICAL or HORIZONTAL
- select ANNOTATE from the VIEW menu and then select VERTICAL or HORIZONTAL

The position of the annotation line and/or text box can be changed by clicking and dragging to the new position – the cursor changes to either  or  when this is possible.

To edit text, either double-click on the callout text box or right-click and select **Properties** from the menu. The **Annotation Settings** window opens and enables text editing. To add multiple lines of text, press **Ctrl - Enter** to start a new line.

To delete an annotation, right-click on the text box and select **DELETE** from the menu.

Note: Annotations are saved in a .PMG file and can be printed with a graph.

Graph Embedding

There may be need by the user to define data within a document. The facility of graph embedding will be a perfect solution for the user in such a situation. This allows the user to copy a graph from the PMAC Plus graph program to a word processing package.

For the example below the Microsoft Word processing package was used.

- The first stage to ensure both PMAC Plus and the Word are both running on the relevant PC.
- From the graph in PMAC plus select the FILE – COPY from the menu bar.
- Now in the Word document click on the position where the graph will be placed.
- Then select EDIT – COPY SPECIAL from the menu bar in Microsoft Word.

- The graph selected will now be visible in the Word document. The special feature of this is that if the user is to double click on the graph within the document then the PMAC Plus graph program will activate and allow the user to alter the graph. E.g. update etc to the user's specification and all highlights will now be inserted into the graph within Microsoft Word.

Edit Calculation

This function enables two or more sets of data values to be combined into a single set of data values by developing a calculation. The calculation can include addition, subtraction, multiplication and/or division involving data sets and/or constants, as required. This is useful, for example:

- to find a total flow, the flows from multiple sites could be added together, or
- to find the pressure drop down a length of pipe, the pressure at the supply point could be subtracted from the pressure at the low point.

The system can even be used to calculate corrected flow.

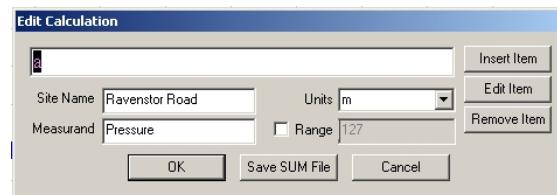
The calculation result can be displayed on screen or saved as a .SUM file for later viewing.

Note: In the equation, the items, constants and data are shown in green, operators are shown in black and parentheses in blue.

To perform a calculation, from the **Graph** window:

- Select a required line to start the calculation from the Line Key and select EDIT CALCULATION from the LINE menu.

The **Edit Calculation** window (right) will open. The selected site is shown as "a" in the upper text box and is detailed in the lower boxes.



Click on "a". At this point the right hand buttons become available, enabling an item to be added (second data file) or the current item to be edited or deleted. Alternatively, right click on the item to open a menu with the same options. If a range, which is too low, is selected, then the data may be shown incorrectly.

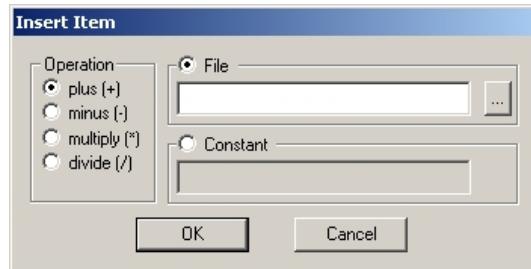
The site name, measurand and units for the calculation can each be chosen and a range can be set. It is recommended that the default range be accepted initially. When the data has been viewed, a lower range may be selected to increase the resolution of the data.

If too low a range is selected, then the data may be shown incorrectly.

- Click on **Insert Item**. The **Insert Item** window (right) appears.

Select the required operation and then either select **File** and enter or select the required second file, or select **Constant** and insert the constant.

Click on **OK**.



3. The **Edit Calculation** window (right) re-opens with the calculation displayed.

At this point, further items (data files) can be inserted into the calculation, or any selected part of the calculation can be edited or deleted, using the right hand buttons.



When the calculation is complete, click on **OK** to view the calculated data or click on **Save SUM File** to save the new data as a .SUM file for later viewing.

Example of a Flow Correction

To calculate Corrected Flow you need to have Pressure, Temperature and Flow data files. The equation is:

$$Q_c = Q_a \times (P / P_r) \times (T_r / T) \times (Z_r / Z)$$

Where

- Q_c** is the Corrected Flow
- Q_a** is the measured Flow
- P** is the measured pressure
- P_r** is the reference pressure
- T** is the measured temperature
- T_r** is the reference temperature
- Z_l** is the compressibility
- Z_r** is the reference compressibility

P_r, T_r, Z_r and **Z** are all constants so the equation becomes:

$$Q_c = Q_a \times (P / T) \times K$$

This can be coded as: -

$$a \times (b/c) \times e$$

Where

- a** Flow data file
- b** Pressure data file
- c** Absolute temperature sum file
- e** Constant

Where 'Absolute Temperature Sum File' is defined as: -

$$(a+b)$$

- a** Temperature data file in Celsius
- b** 273.15

Viewing a SUM File

To view a .SUM file, either:

- with PMAC Plus running, double-click on the file in Windows Explorer, or
- with the PMAC **Graph** program running and a site selected, select LINE - ADD LINE, click on the **File** tab and choose the required .SUM file from the list.

The .SUM file will be displayed.

Editing a SUM File

With a .SUM file displayed, the Edit Calculation facility is available and can be used to edit the calculation used to produce the .SUM file.

To add, edit or delete items, follow the procedure detailed in **Edit Calculations**, above.

PMG Files

A displayed graph can be saved, using the SAVE or SAVE AS commands from the FILE menu. The graph is saved as a .PMG file, which contains the current configuration details for the graph and a reference to the data file(s). It does not contain the data. PMG files have default names and can be loaded automatically with the associated graph if the names are used. Saving as a .PMG file is especially useful when a particular section of data, configured in a particular layout, needs to be viewed at a later date.

With the Graph window open, a .PMG file can be opened using NEW and OPEN from the FILE menu. Assuming that the referenced data file, or files, is/are still available on the PC, the graph will be displayed as saved.

The most recently viewed .PMG files are listed in the FILE menu for quick access.

Printing Graphs

Graphs may be plotted on any Windows supported printer or plotter. To print a graph proceed as follows:

1. Display the region to be plotted in the window.
2. Select PRINT from the FILE menu.
3. Select the required printer from the list.
4. Click on **Options** and set up the printer options.
5. Press the **Print** button.

Only printers already configured in Windows are available. If a required printer does not appear on the list, then it will need to be installed using the Windows Settings - Printers functions.

Print Preview

Select PRINT PREVIEW from the FILE menu. The graph is shown as it will be printed. It can be printed directly from this window.

Updating Data

Note: Update Data and Continuous Update Data functions are only applicable to sites where the logger is connected to a remote communications system.

Update Data

To select a data update, either:

- Select UPDATE DATA from the LINE menu, or
- Click on **Update Data**  in the tool bar.

The command requests the latest data from the logger. Any new data is downloaded from the logger. You are notified when download is complete and prompted whether the graph should be re-scaled to show the new data.

Continuous Update of Data

This is similar to the Update Data function, except that the telephone connection is maintained until **Stop Update** is pressed.

While the continuous update is in operation the graph will display each new data point as it is recorded. This is useful when a critical operation is occurring at a site and it is important to obtain the latest data as soon as it is available.

Caution: The communication with a site does not time-out, even when the screen saver comes into effect, so it is possible for very long phone calls to occur by accident. Another problem that will occur is the vast reduction of the life of the battery within the datalogger. It is recommended that hourly polling be used in place of continuous update in most situations and even then used sparingly.

Continuous Update cannot be used for more than one graph at a time.

Exporting Data (Graphs)

Data may be exported to the Windows clipboard or as a file to another program for further work; the range of data currently displayed in the **Graph** window is exported.

The function creates a "comma-separated-value" (.CSV) information file. .CSV data is in the form of a text file and is accepted by most DOS and Windows spreadsheets.

To export data:

1. Select the EXPORT function in the LINE menu.
The **Export Options** window (right) opens.
2. Select the required destination - **Clipboard** or **File**.

Select the number of decimal places to use for the exported data.

Choose whether to include: -

- Time Axis Values – This will include a date/time column in the spreadsheet.
- No Data as Blank Lines – If there are any gaps in the data then the spreadsheet will produce a blank in the list of data.
- Decimal Days Calculated from 1900 – This option is best used when recalculating the date with the facilities within the chosen format. (For further information see the example below)

Choose the format - Excel or Lotus 123.

3. If save to **Clipboard** is selected, the data is exported to the Windows Clipboard. From there, it can be pasted directly into a Windows spreadsheet (e.g. Excel).

Depending on the data and logging rates, only small amounts of data can be transferred this way - typically a few days.

4. If save to **File** is selected, the data is saved to a .CSV file which can then be imported into the spreadsheet. The amount of data that can be exported in this way is normally only limited by your disk space. However, in some spreadsheets there is a limitation on the number of lines displayed; this may then require multiple exports.



Note: CSV files can be very large so do not forget to delete the .CSV file after the import into the spreadsheet.

An Example of Decimal Days Calculated from 1900

*Note: The following is an example of 'Decimal Days Calculated from 1900' processing through Microsoft Excel **after** the Export File has been created.*

After selecting the date in the time axis value column then selecting Format – Cells – Date – and then an appropriate format which includes both the date and time the following results are achieved.

	A	B
7	Time	Flow 2
8	07/10/99	
9	36440.42639	0
10	36440.42778	0
11	36440.42917	0.15
12	36440.43056	0
13	36440.43194	0.15

Before

	A	B
7	Time	Flow 2
8	07/10/99	
9	10/7/99 10:14	0
10	10/7/99 10:16	0
11	10/7/99 10:18	0.15
12	10/7/99 10:20	0
13	10/7/99 10:22	0.15

After

Values

The **Values** function displays individual data readings and summaries for defined periods from a selected site.

To display Values, either:

- select the required site in the **Site Database** window and:
 - select TOOLS - VALUES from the menu bar, or
 - click on  in the tool bar.
- from the **Graph** window, select a line and then select VALUES from the LINE menu.
- Right click on a .DAT or .NWL file and select VALUES.

Summary Display

As an alternative to listing each item of data, simple statistical analysis (for example, mean value over six hour periods) can be performed on data and single summary values can be derived for set time periods. The available summary periods will vary with the data recording rate.

This feature is useful for finding daily totals, minimum flows etc.

The Values Window

Values - Ravenstor Road (Pressure) (SYSTEM MANAGER)	
File	Help
Summary : No	
Date/Time	
21 Nov 00 16:00:00	39.500
21 Nov 00 16:15:00	37.000
21 Nov 00 16:30:00	37.500
21 Nov 00 16:45:00	39.500
21 Nov 00 17:00:00	39.000
21 Nov 00 17:15:00	39.000
21 Nov 00 17:30:00	38.500
21 Nov 00 17:45:00	38.000
21 Nov 00 18:00:00	38.500
21 Nov 00 18:15:00	39.500
21 Nov 00 18:30:00	38.500
21 Nov 00 18:45:00	39.000
21 Nov 00 19:00:00	35.500
21 Nov 00 19:15:00	37.000
21 Nov 00 19:30:00	34.500
21 Nov 00 19:45:00	35.000
21 Nov 00 20:00:00	35.500
21 Nov 00 20:15:00	35.500
21 Nov 00 20:30:00	34.500
21 Nov 00 20:45:00	38.500
21 Nov 00 21:00:00	38.500
21 Nov 00 21:15:00	38.500
21 Nov 00 21:30:00	39.500
21 Nov 00 21:45:00	39.500
21 Nov 00 22:00:00	38.000
21 Nov 00 22:15:00	41.000

The **Values** window displays a column of dates and times followed by the corresponding readings.

Menu Bar Options

Note: Some menu bar functions may not be available to you if you have Normal Operator or Casual Operator access.

FILE MENU

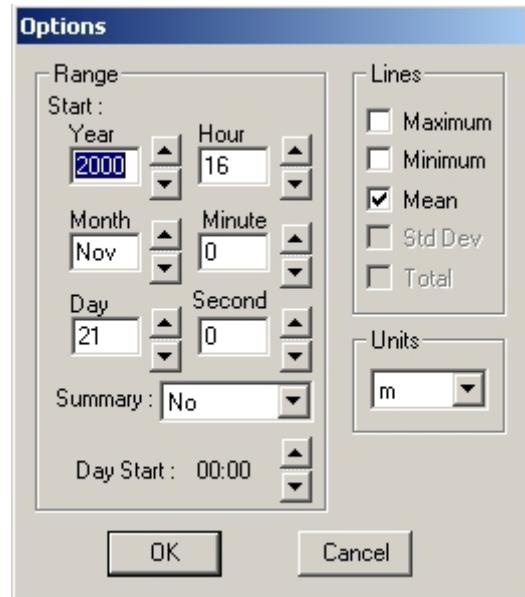
Options...	Opens the Options window - enables definition of the displayed range and units. If a Summary is selected, enables selection of summary period and Lines (if not already enabled).
Print	Prints the current table. Available options include insertion of a Subtitle and setting of the period to print.
Export	Opens the Values Export window - enables configuration of selected data into .CSV format for export either to a file or to the Windows Clipboard.
Graph	Opens the Graph window with the data displayed as a graph.
Exit	Closes the Values window.

HELP MENU

Index	Access to on-line help.
About Values...	Displays the About Values window.

Setting Options

1. Select OPTIONS from the FILE menu. The **Options** window (right) opens.
2. In the **Range** region, set the required range of data to be displayed.
 If a Summary display is required, click on the **Summary** drop-down box and select the required summary period.
3. In the **Lines** region, select the required display formats.
4. In the **Units** region, select the required units.
5. When settings are complete, click on **OK**.

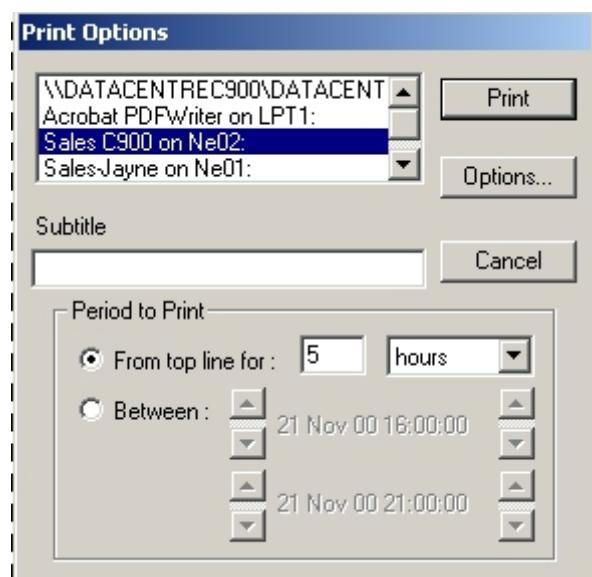


Printing Values

A Values table may be plotted on any Windows supported printer or plotter. To print a table, proceed as follows:

1. Display the region to be plotted in the window.
2. Select PRINT from the FILE menu. The **Print Options** window (right) opens.
3. Select the required printer from the list.
4. Enter a **Subtitle** to appear on the print if required.
5. Select the required **Period to Print**.
6. Click on **Options** and set up the printer options.
7. Press the **Print** button.

Only printers already configured in Windows are available. If a required printer does not appear on the list, then it will need to be installed using the Windows Settings - Printers functions.



Exporting Data (Values)

Values data can be exported to the Windows clipboard or as a file for use in other programmes.

The function creates a “comma-separated-value” (.CSV) information file. .CSV data is in the form of a text file and is accepted by most DOS and Windows spreadsheets.

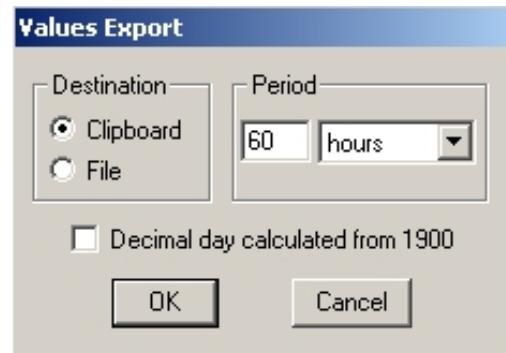
To export Values:

1. Select the EXPORT function in the FILE menu. The **Values Export** window (right) opens.
2. Select the required destination - **Clipboard or File**.

Select the **Period** to save.

Choose whether to use decimal days.

3. If save to **Clipboard** is selected, the data is exported to the Windows Clipboard. From there, it can be pasted directly into an appropriate Windows program.
4. If save to **File** is selected, the data is saved to a .CSV file which can then be imported into a spreadsheet. The amount of data that can be exported in this way is only limited by your disk space.



10 Viewing Log Files (Log Report)

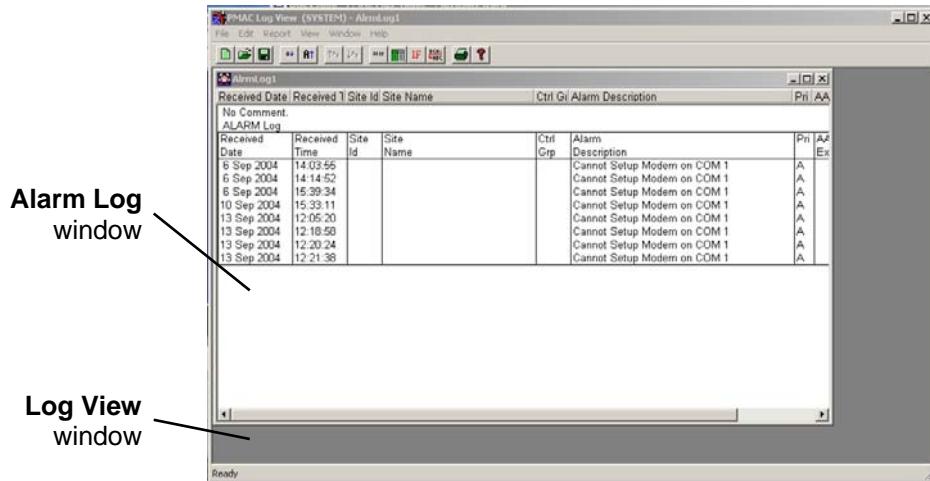
Log Files

PMAC maintains three log files, which are used to monitor the operation of the software. They are:

- **Alarm Log** contains a list of alarm conditions that have occurred, including those received from loggers, together with their present state.
- **Comms Log** records all communications transactions with remote sites.
- **User Log** contains a record of the basic operation of PMAC Plus, including program start and stop times.

The Log View Window

When selected, each type of log file is displayed inside the **Log View** window.



The **Log View** window has a menu bar and tool bar that provides access to the functions required to use the log files.

Menu Bar Options

Note: Some menu bar functions may not be available to you if you have Normal Operator or Casual Operator access.

FILE MENU

New Log... (Ctrl + N) Opens the **New** window - enables opening of a new alarm, comms or user log.

Open... (Ctrl + O) Enables selection and opening of a previously saved view of a log.

Close Closes a selected log.

Save (Ctrl + S) Saves a view of a selected log. If previously unsaved, opens **Save As** window.

Save As...	Saves a view of a selected log, with a different name and into a different directory if required.
Print...	Opens Print window - enables printing of selected log.
Print Preview	Displays a preview of a printable log.
Print Setup...	Enables printer selection and setup.
Recent File	Lists recently accessed files.
Exit	Closes the Log View window.

EDIT MENU

Copy (Ctrl + C)	Copies a log to the clipboard.
Zoom >	Enables Zoom In or Zoom Out view of selected log.
Show >	Selects Next or Previous page (when appropriate).
Select All	(Alarm log only) - Selects all lines on the current page of the report.
Select All Unacknowledged Alarms	(Alarm log only) - Selects all unacknowledged alarms on the current page of the report.
Acknowledge Alarm	(Alarm log only) - Acknowledges a selected alarm.
Delete Old Entries	Enables deletion of all records BEFORE a specified date.
Acknowledge All Alarms	(Alarm log only) - Acknowledges all alarms immediately.

*Note: This is **NOT** recommended for normal use.*

REPORT MENU

Comment	Opens Report Comment window - allows attachment of comment to selected log.
Columns	Allows addition and deletion of topic columns in report windows.
Criteria	Opens Criteria window for the selected log type - allows setting of criteria appropriate to the log type. Allows filtering out of unwanted entries.
Sort	Opens the Sort window - allows selection of primary and secondary sort parameters.
Show SQL	Displays the underlining Structured Query Language (SQL) statement that is created from the options selected in the columns and the sort and filter options. Normally only used in support of the software.

VIEW MENU

Toolbar	Ticked when enabled (Tool Bar displayed).
Status Bar	Ticked when enabled (Status Bar displayed).

WINDOW MENU

New Window	Opens a new Log window of the currently selected type.
------------	---

Cascade	Cascades multiple windows.
Tile	Tiles multiple windows.
Arrange Icons	Re-arranges minimised Log windows within Log View window.
Open windows	All open windows are listed at the bottom of the menu.

HELP MENU

Index	Access to on-line help.
About PMLOGREP	Displays the About PMAC Log Reporting window.

Tool Bar Options

Note: Some tool bar functions may not be available to you if you have Normal Operator or Casual Operator access.

-  Opens the **New** window - enables opening of a new alarm, comms or user log.
-  Enables selection and opening of a previously saved view of a log.
-  Saves a view of a selected log. If previously unsaved, opens **Save As** window.
-  Enables zoom Out view of selected log.
-  Enables zoom In view of selected log.
-  Selects Previous page (when appropriate).
-  Selects Next page (when appropriate).
-  Opens **Report Comment** window - enables attachment of comment to selected log.
-  Enables addition and deletion of topic columns in report windows.
-  Opens **Criteria** window for the selected log type - enables setting of criteria appropriate to the log type.
-  Opens the **Sort** window - enables selection of primary and secondary sort parameters.
-  Opens **Print** window - enables printing of selected log.
-  Displays the **About PMAC Log Reporting** window.

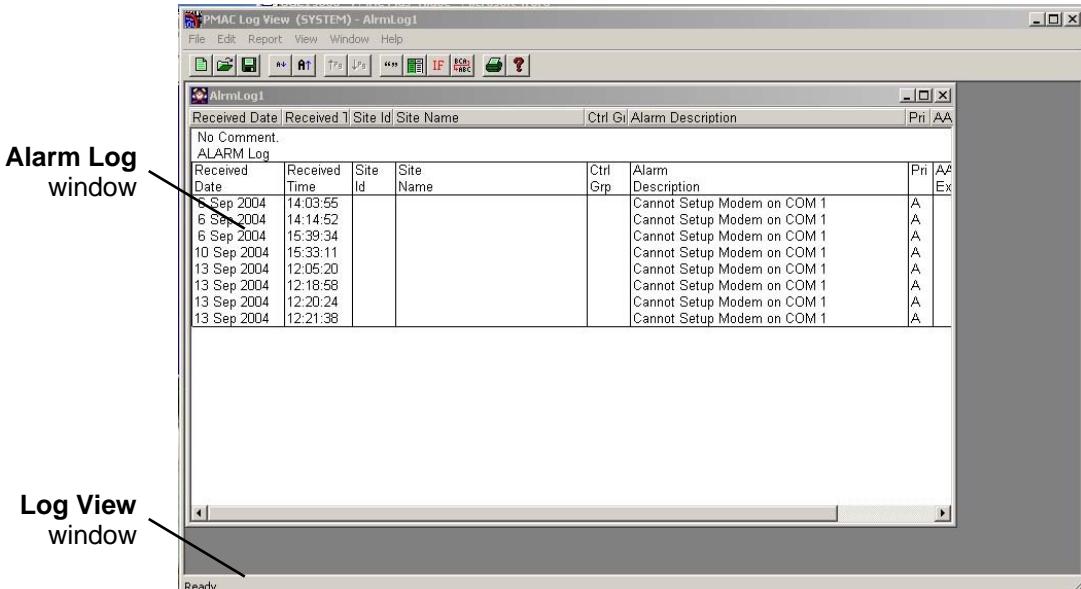
Accessing a Log

To open a log:

1. Select LOG REPORT from the UTILS menu in a **PMAC** window.
2. The PMAC Log View window opens with the New window (right) inset.
3. To start a new log, select the required type from the New window and click OK.
4. To open a previously saved log, close the New window, select OPEN from the FILE menu and select the required log.



Alarm Log



Alarm Sources

Alarms can be originated by a logger and can be generated by a variety of events, depending on the logger set up (Set up using the Logger Settings Editor). For example, alarms could indicate door switch activation, logged pressure dropping below a set value or the logger battery charge falling below minimum. The alarm is passed through the modem/telephone link to the PC.

Note: Logger alarms can be generated from all E5565 protocol loggers and from GPS protocol Utilog and Newlink loggers. All other GPS protocol loggers cannot produce alarms unless connected to a "Dialog 377" unit.

There are also many internal alarms, which can be generated by the PMAC program. For example, failure to poll a certain logger (Communication Failure alarm), failure to open a comms port on the PC etc.

Receipt of an Alarm

On receipt, each alarm is displayed in an **Alarm Banner** window (which has a red background) and in the **Alarm Log** window (printed in red). The **Alarm Banner** window is always shown on top of any other open window; it can be moved around the screen as required but will return to its original position if a new alarm is presented.



The **Alarm Banner** window always displays the last received alarm of highest priority. If the displayed alarm is acknowledged (see **Acknowledging Alarms**, below), the window will display the next received alarm of highest priority which is unacknowledged. The **Alarm Banner** window is removed only when all alarms in the **Alarm Log** have been acknowledged.

Acknowledging Alarms

The requirement to acknowledge alarms is designed to ensure that the operator is aware of an alarm condition, which may need a response.

To acknowledge an alarm, select it from the **Alarm Log** window with the mouse and then select **ACKNOWLEDGE ALARM** from the **EDIT** menu. This will change the log entry from red to shaded and change the entry in the **Priority** column to "Ack".

If there are several alarms present in one call, a separate entry will be placed in the **Alarm Log** for each alarm.

Notes:

1. *Casual operators cannot acknowledge alarms.*
2. *The use of the ACKNOWLEDGE ALL ALARMS option in the EDIT menu should be avoided unless there are many obsolete alarms which do not require an individual check and response – in this case you are recommended to “Select All Unacknowledged Alarms” and acknowledge each alarm individually.*

Alarm Log Columns

The columns displayed in the **Alarm Log** are configured using the **COLUMNS** option in the **REPORT** menu. The information recorded in each column is configured using the **CRITERIA** option in the **REPORT** menu.

The following column options are available:

ALARM DATE - ALARM TIME - RECEIVED DATE - RECEIVED TIME

The **Alarm Date** and **Alarm Time** columns show the date and time, as recorded in the logger, that an alarm occurred.

For alarms which do not have the occurrence date and time recorded in the logger (e.g. Power Supply alarms), the time of receipt of the alarm is placed in the **Received Date** and **Received Time** columns.

*Note: Entries are normally listed in the **Alarm Log** in chronological order. However, alarms which do not have an occurrence date and time may be recorded out of order because the alarm may be received (and entered in the log) some time AFTER it was generated.*

SITE ID AND SITE NAME

These columns record the Site ID and Site Name for each alarm.

CTRL GRP - CONTROL GROUP NAME

These columns display the Control Group to which the site generating an alarm is assigned.

ALARM DESCRIPTION

This column shows a text-based description of the alarm.

PRI

The **Alarm Priority** column indicates one of the following states:

HHigh priority alarm which has not been Acknowledged

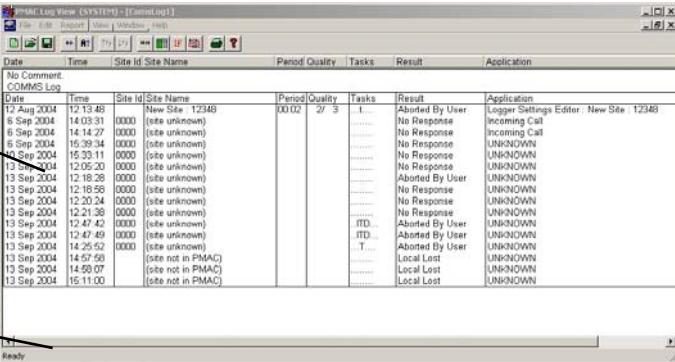
LLow priority alarm which has not been Acknowledged

AAn alarm which has been Acknowledged

AAP EXECUTED

This column lists any Alarm Action Programs (AAPs) which were executed as a result of the alarm. AAPs can perform a variety of tasks such as raising control pressure on a site, sending the alarm to a message pager etc.

Comms Log



The screenshot shows the PMAC Log View application window. The title bar reads "PMAC Log View (SYSTEM) - [CommsLog1]". The menu bar includes File, Edit, Report, View, Windows, Help. The toolbar has icons for New, Open, Save, Print, and Help. The main area is divided into two panes: "Comms Log" and "Log View". The "Comms Log" pane displays a table of communication logs with columns: Date, Time, Site Id, Site Name, Period, Quality, Tasks, Result, and Application. The "Log View" pane shows a detailed log of a specific communication session. A legend at the bottom of the Log View pane defines abbreviations: ITD, Abort By User, No Response, Incoming Call, Unknown, and Local Lost.

The **Comms Log** records details of all communication with remote sites. If there are no sites configured and equipped to use remote communications, then this log is not applicable.

Comms Log Columns

The columns displayed in the **Comms Log** are configured using the COLUMNS option in the REPORT menu. The information recorded in each column is configured using the CRITERIA option in the REPORT menu.

The following column options are available:

DATE AND TIME

The **Date** and **Time** columns record the date and time that a remote communication process is started.

SITE ID AND SITE NAME

These columns record the Site ID and Site Name for each call.

PERIOD

This details the duration of the call to the remote site, in minutes and seconds.

If contact is not established with the remote site, a duration (and Quality) will not be written to the **Comms Log**.

If a duration is not recorded, the remote site may have answered the call but failed to connect correctly with the modem. This possibility should be considered if the **Comms Log** is examined for billing purposes, since such calls will still be charged. The **Result** message may indicate what exactly happened in such cases.

QUALITY

The two numbers describe the number of packets of information received and sent by the computer respectively. Dividing the first number by the second (as displayed) gives an indication of communication quality with a remote site. A result of 1 occurs when both numbers are the same and this represents perfect communication.

If the number of packets sent (the second value) is greater than the number received (the first value), this means that some packets were sent and did not receive a valid reply. In these cases the computer will retry as defined by the protocol.

Examples of calls to remote sites:

- 9/9** 9 packets sent and 9 received, perfect communication (100%).
- 9/10** 10 packets sent and 9 received, 1 packet lost (90%).
- 0/6** No packets received.

TASKS

This indicates the tasks performed when the site was contacted, as follows:

- A** Process incoming alarm.
- P** Send new pressure control profiles to logger, and reset failsafe profile switch timeout.
- I** Read index from logger.
- T** Read settings and status from logger tables.
- D** Read latest data from logger on all channels (new data recorded since last read).
- C** Update logger clock with latest date and time from computer.
- U** Update logger settings.

Note: Letters appearing in lower case indicate tasks, which were not completed successfully. All tasks will be in lower case if contact was never established with the remote site.

RESULT

This column describes the result of communication with a remote site. The following messages are generated:

OK	Call successful
OK (timeout)	Call successful, but terminated automatically after a period of no activity by the user.
No response	No response received from a modem when PMAC Plus dials a site.
Carrier Lost	Computer modem could no longer detect a carrier signal from the remote modem, so call terminated.
Contact Lost	No reply from remote site after several packets sent, so call terminated.
Aborted	Call terminated prematurely by user.
Local Lost	Lost connection to a locally connected device.
Incoming Call	Modem connection was terminated because a logger tried to dial in as you tried to dial out.

All other messages are generated by the modem and are in upper case. Refer to **Section 11 - Troubleshooting** for further information.

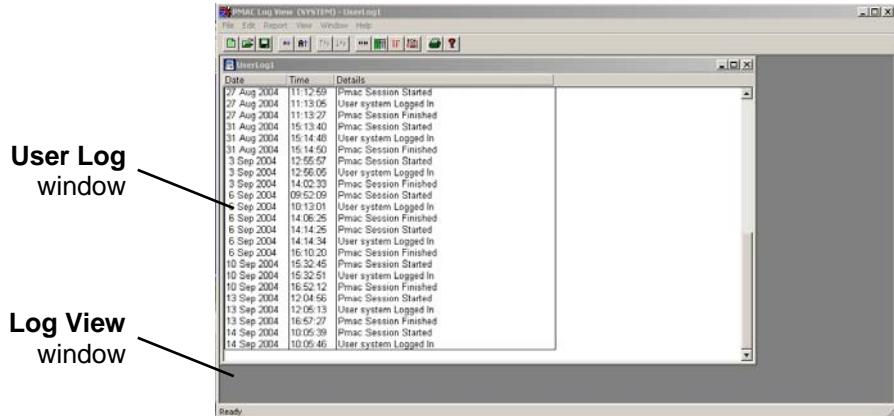
APPLICATION

This details the program originating the communication request: The replies will differ depending on the specific application. These replies usually have a suitable description but if the user requires any further information then contact the Technolog Help Desk.

PORT

This indicates the comms port used for the communication.

User Log



The columns displayed in the **User Log** are configured using the COLUMNS option in the REPORT menu. The information recorded in each column is configured using the CRITERIA option in the REPORT menu.

Depending on which columns and criteria are configured, the **User Log** can record the **Date**, **Time** and **Details** of the following events:

- Session start/stop
- Access level change
- Occurrences of three failed attempts to enter a password.
- The specific user name for logging in/out.

It can also record messages such as Auto-Poll running status.

11 Logger Setting Editor

The Logger Settings Editor is used to view and define all the parameters for a logger's operation, e.g. logging rates, PMAC ID, ranges, etc. It is also used to start and stop logging and to set a logger's clock. The Logger Settings Editor can be used with local or remote loggers.

Logger Setup

To set-up a logger locally, connect the logger to the local comms port with a suitable cable, open the **Local Comms** dialog box, select the **Logger** tab and select **Setup Logger**.

To set-up a logger remotely, select **EDIT LOGGER SETTINGS** either from the **TOOLS** menu in the **Site Database** window or from the Task List if available.

Communicating With a Logger

When communicating locally with a logger, the Logger Settings Editor first reads the settings from the logger and presents them to the user as a set of "tables".

When communicating remotely with a logger, the Logger Settings Editor reads the last saved settings from the hard disk and presents them. If there is no saved information for this logger, the logger will be called and the settings read from it.

The tables shown vary depending on how the logger is configured and the type of logger. Also, some fields are only editable when the logger is at "Standby" (i.e. not logging) or is connected locally to the PC.

Tables may initially be shown as small bars at the bottom of the **Logger Settings Editor** window. Clicking on one of these bars will open up a window showing the settings they contain.

Note: For details of the settings shown, the appropriate logger manual should be consulted.

Updating Settings from a Logger

This option is only suitable where loggers are connected to a communications system. It will refresh all the tables of the Logger Settings Editor and may be used at any time by selecting **UPDATE FROM LOGGER** from the **FILE** menu.

When the settings have been updated, some fields that previously could not be edited will now be accessible. There may also be extra information such as alarm times, alarm status, current value, scratch pad etc.

Read All Logger Settings

This option forces the logger settings editor to update every aspect of the logger setup. Use of this option is recommended when a new logger is installed at an existing site.

Copy and Paste

The settings from one logger can be copied to another logger as follows.

1. Select **COPY** from the **EDIT** menu in the source Logger Settings Editor.
2. Select **PASTE** from the **EDIT** menu in the destination Logger Settings Editor.
3. Select the data strategies to be transferred.
4. Click on **Paste**

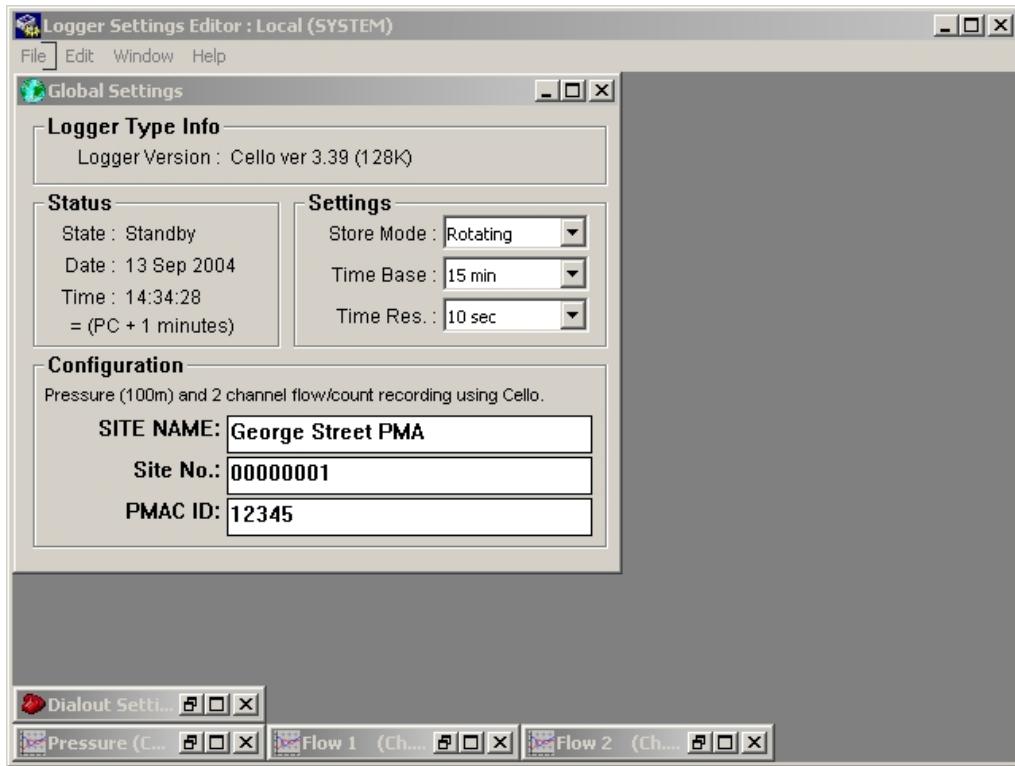
Alarm Actions

The ACTIONS menu (only shown for E5565 protocol loggers) enables configuration and editing of responses to received alarms. Enabled actions are indicated with a tick. Any actions not enabled will not be executed. To edit an action, select it from the menu. By default all actions are disabled and must be enabled for each site by selecting ENABLE from the ACTIONS menu.

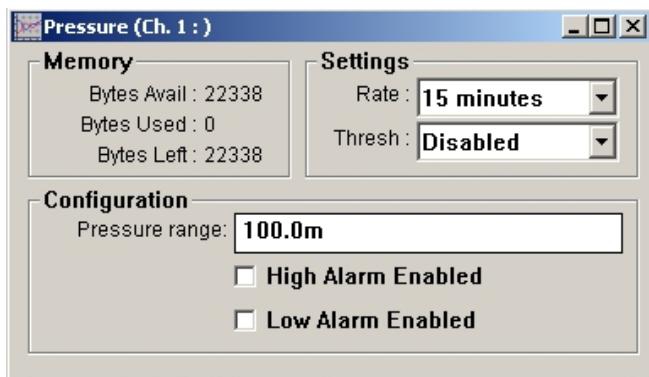
Technolog GPS Protocol Logger Settings

Note: For complete details of the settings shown, the appropriate logger manual should be consulted.

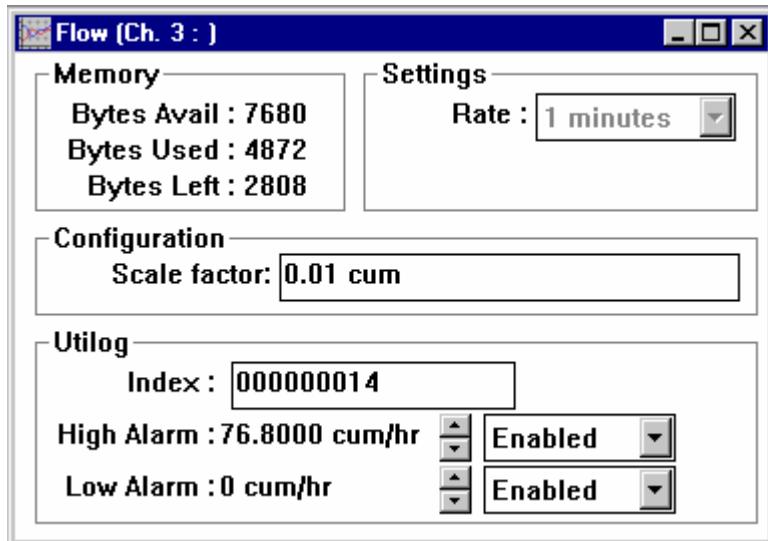
The **Global Table** shows the general setup of the logger.



The Channels are shown in individual tables.



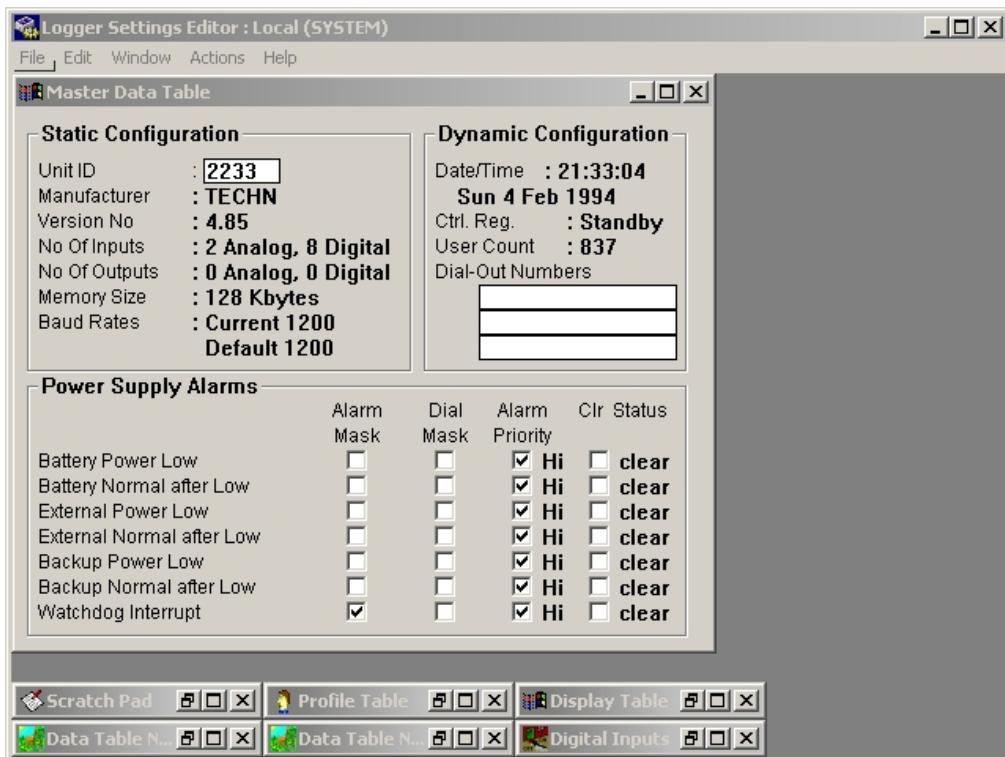
Channels on a Utilog show extra information concerning alarms levels and index values.



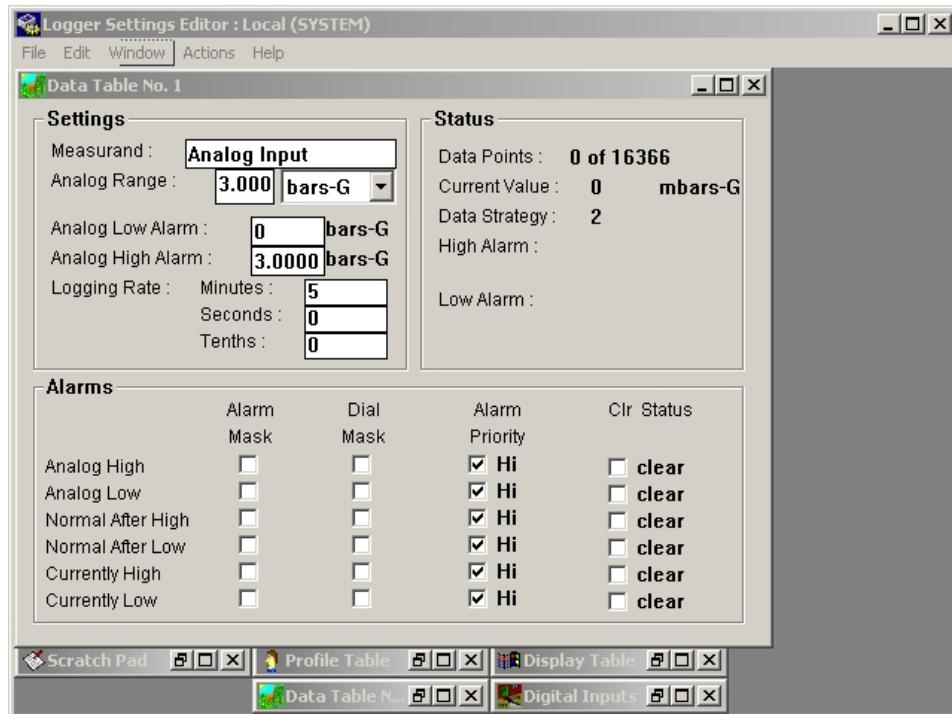
E5565 Protocol Logger Settings

Note: For complete details of the settings shown, the appropriate logger manual should be consulted.

The **Global Table** shows the general setup of the logger.

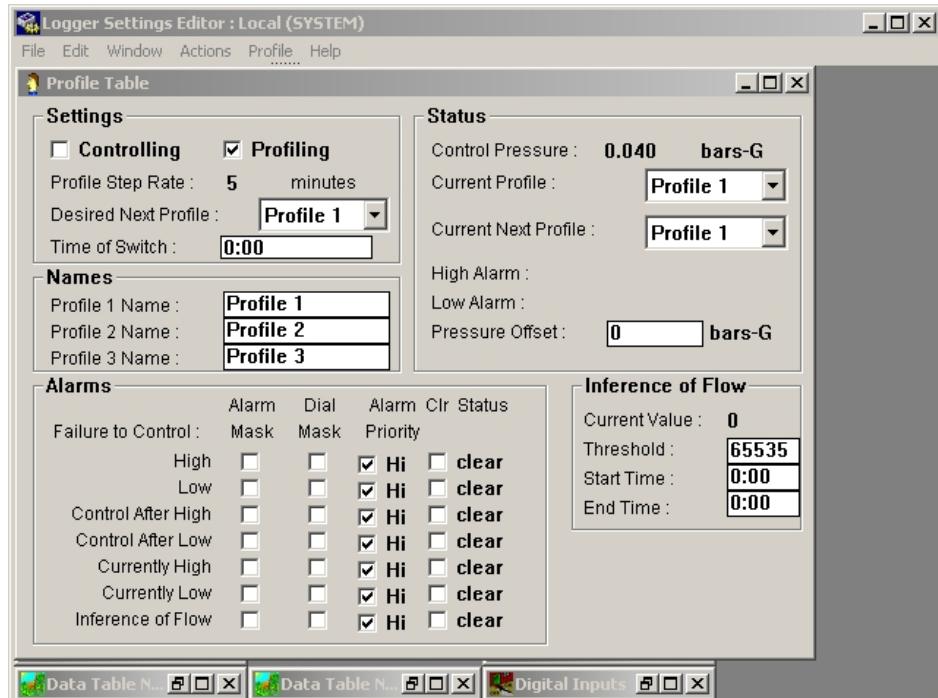


The Channels are shown in individual tables.



The profile settings of a Newlog 4 Profiler or Autowat 4 can be set on the **Profile Table**.

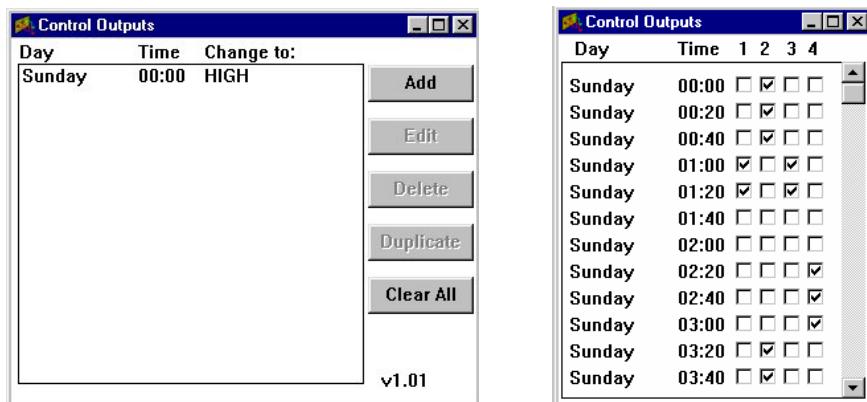
When this table is selected the PROFILE menu is made available. The EDIT PROFILES menu item opens the **Profile Editor** allowing the three profiles to be viewed and edited. The EDIT PROFILES menu item may also be available from the Task List.



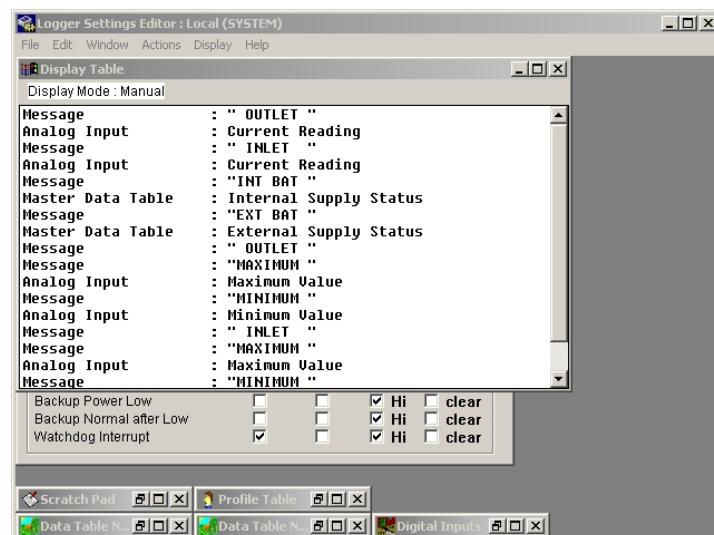
Other tables include digital inputs,



control outputs,

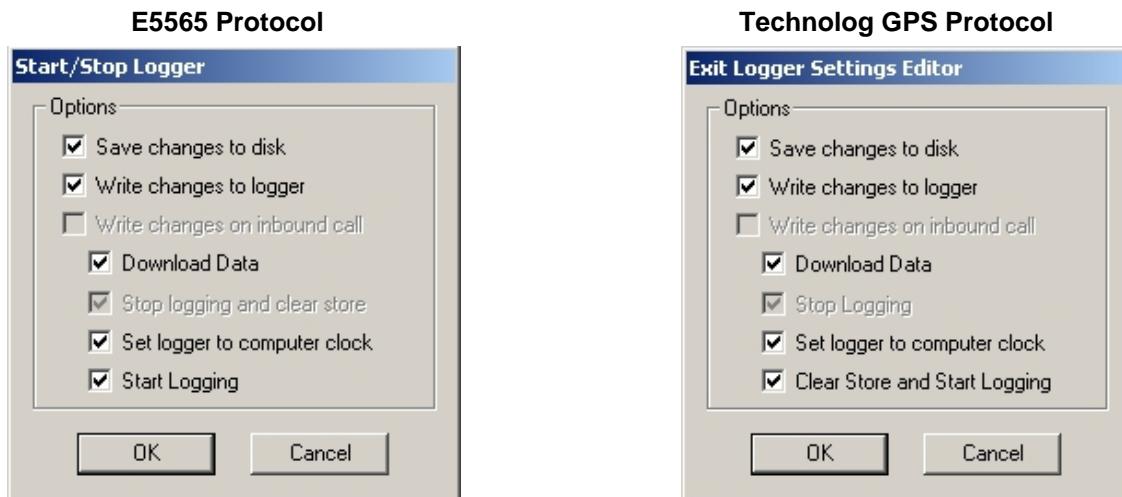


and display tables.



Starting/Stopping Logging and Setting the Clock

When exiting the Logger Settings Editor, the user is presented with one of the following two windows depending on the Protocol used.



Save Changes to Disk

stores the settings read from the logger in an LGR file in the PMAC\LOGGERS directory. This information is required for some PMAC operations.

Write Changes to Logger

saves any changes made to the setting tables back to the logger.

Write Changes on Inbound Call

is only enabled for Utilogs. It remembers the changes that have been made and the next time the logger dials in to PMAC the changes are written to it.

The last four check boxes are listed in the order in which the operations are performed. Selecting one of the check boxes may enable or disable some of the others. This is because some of the operations require or recommend the use of other options.

Download Data

Reads the latest data from a logger. This ensures that all the data has been read from the logger. It is enabled if any of the other four check boxes are selected. Its use is only recommended; it is not necessary and so may be disabled if desired.

Stop Logging

This will stop a logger logging. In E5565 protocol the data will be deleted from the logger as well. Once a logger has been stopped, its clock may be set. If the logger is already stopped then this action will do nothing.

Set Logger to Computer Clock

This will set the clock in the logger to the same time as in the PC real-time clock. The logger must have been stopped before this can be done.

Start Logging

Starts the logger logging. Clicking this option will enable all the other options.

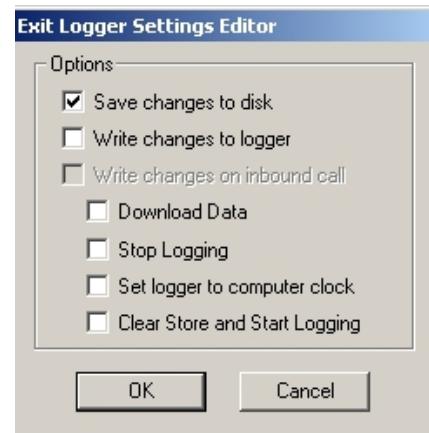
When all the required check boxes have been selected, then click on **OK**. If any communication is required then it will be performed after which the Logger Settings Editor will be closed.

If it is required that the Logger Settings Editor remain open after communication has been performed then use the START/STOP menu item instead. This will show dialog boxes that are very similar to the **Exit** ones.

E5565 Protocol



Technolog GPS Protocol

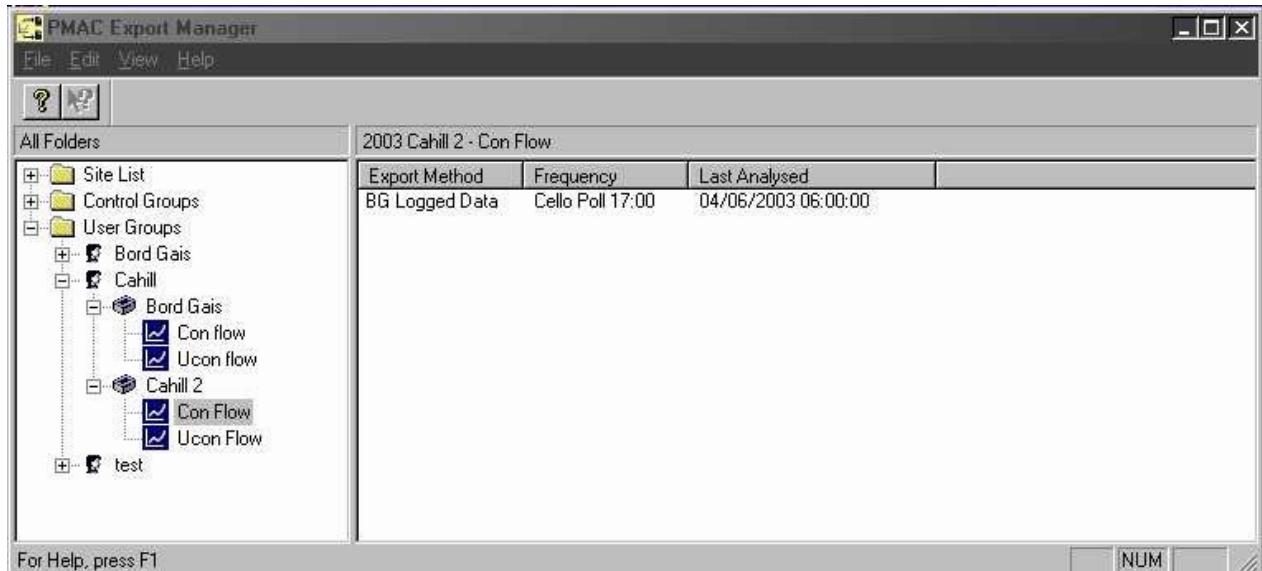


12 Export Manager and Scheduler

About PMAC Export Manager

The Export Manager is a program used for exporting and analysing PMAC data files. There are three parts to the Export Manager.

- **Export Manager**, this program is used for setting up and maintaining which export methods are assigned to which sites and channels. This program can also be used for manual exports.
- **Export Manager Scheduler**, is used to schedule when automatic exports take place.
- **Export Modules**, these modules perform the exporting. The type export provided depend which export modules are installed on the your computer. By default all computers which have the Export Manager will have the CSV Export Module installed.



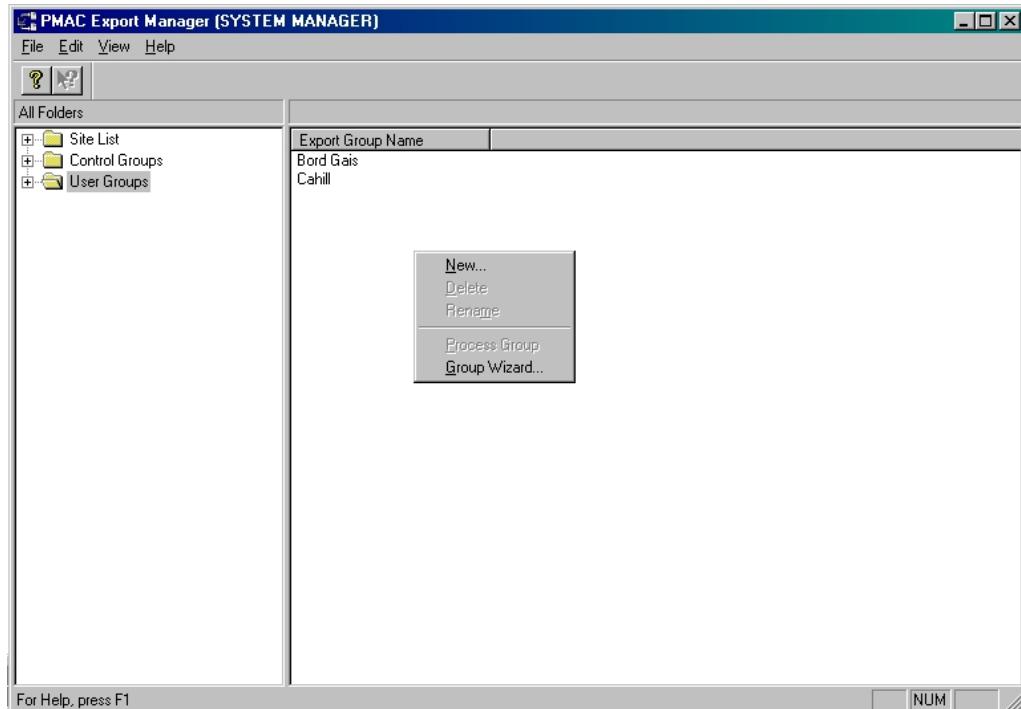
The Export Manager interface is similar to the Windows Explorer. The left-hand pane of the display has a tree view, which contains

- Site List, displays the sites in PMAC.
- Control Groups, contains subgroups any control groups which are set up in PMAC.
- User Groups, these allow the user to set up there own grouping system for assigning export methods and perform manual analysis.

The right hand pane displays a list view, which will display more information about selections made in the tree view. Using the right mouse button in this window accesses most of the actions performed in the Export Manager.

User Groups

Add a New User Group

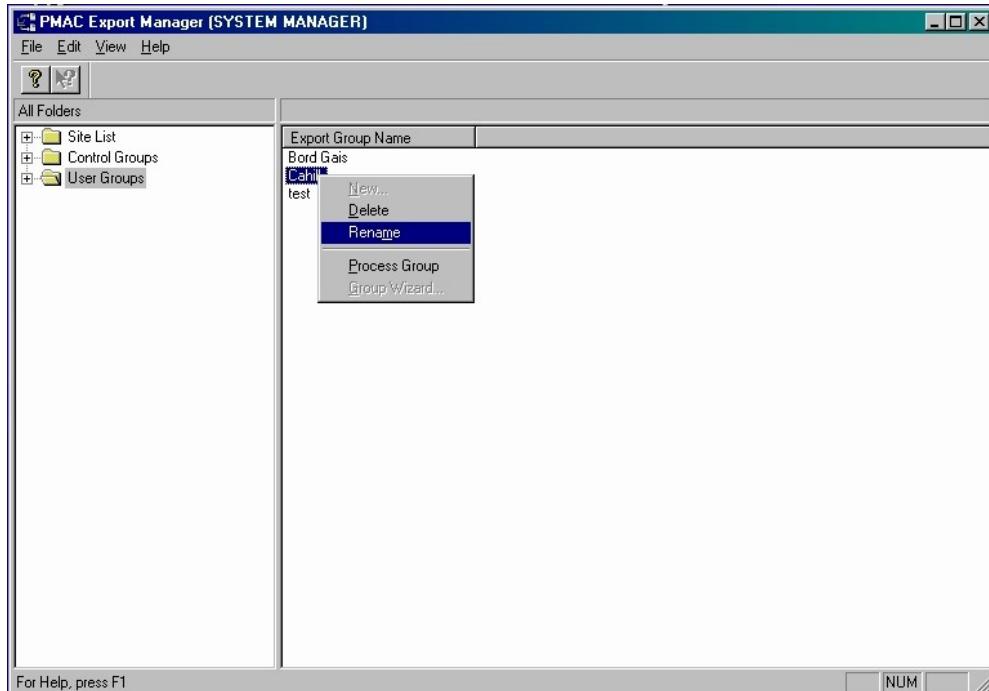


- Select the User Group folder in tree view in the left-hand pane of the Export Manager Window.
- Move to the list view in the right hand pane and press the right mouse over an away from any User Groups that are already defined.
- Select NEW from the popup menu. A new User Group appears with a temporary name.
- Type a name for the new User Group, and then press ENTER.

Tip

- You must have PMAC in System Manager mode to use this option.

Rename a User Group

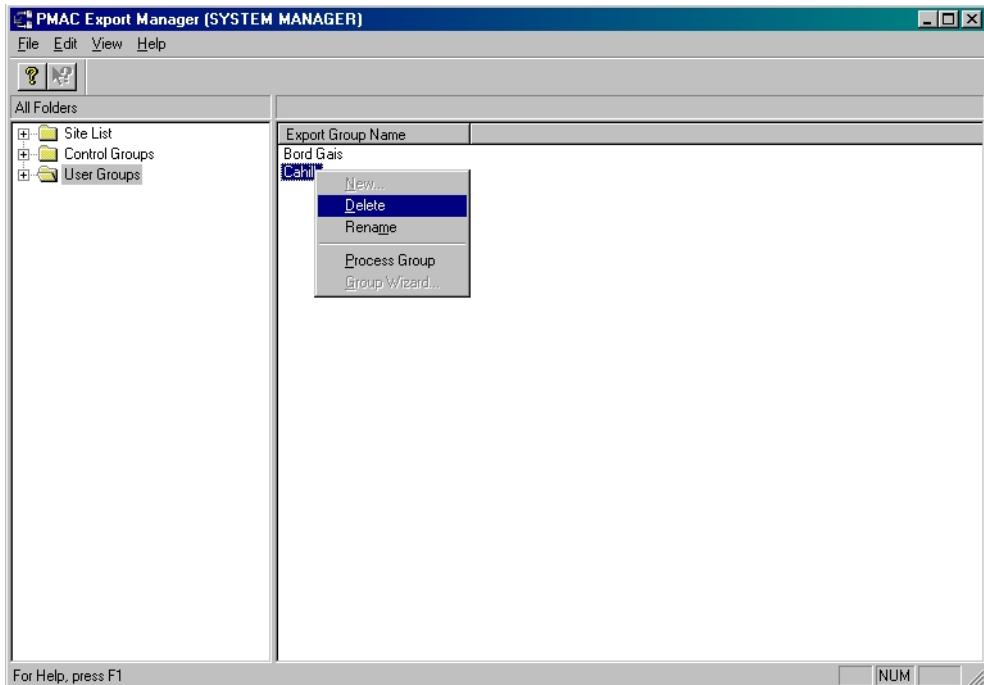


- Select the User Group folder in tree view in the left-hand pane of the Export Manager Window.
- Move to the list view in the right hand pane and select the User Group you which to rename.
- Press the right mouse button and select Rename.
- Type the new name, and then press ENTER.

Tip

- You must have PMAC in System Manager mode to use this option.

Delete a User Group



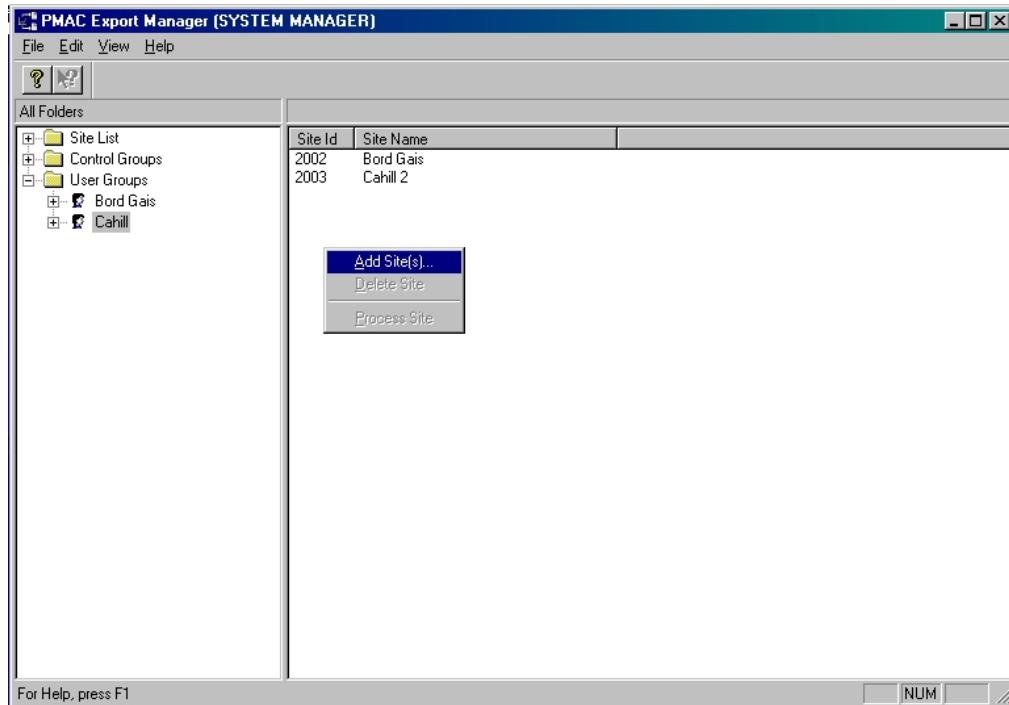
- Select the User Group folder in tree view in the left-hand pane of the Export Manager Window.
- Move to the list view in the right hand pane and select the User Group you wish to delete using the left mouse button.
- Press the right mouse button and select Delete from the popup menu. You will be prompted with a message box asking you to confirm the deletion.

Tip

- You must have PMAC in System Manager mode to use this option.

Sites in User Groups

Add a Site to a User Group

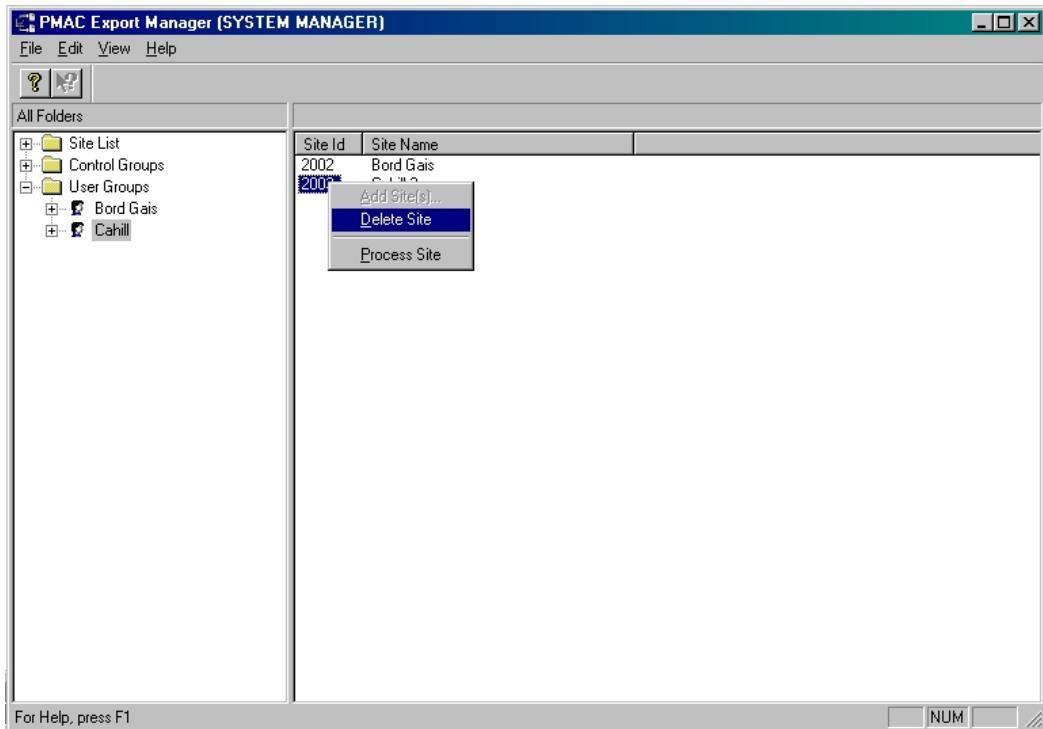


- Select the User Group to add a site to from the tree view in the left-hand pane of the Export Manager.
- Move to the list view in the right hand pane and press the right mouse over an away from any sites that are already assigned to the group.
- A select Add Site(s) from the popup menu.
- Select the site you wish to add and press Ok.

Tip

- You must have PMAC in System Manager mode to use this option.
- Multiple sites can be added by holding down the Shift and Ctrl keys.

Delete a Site from a User Group



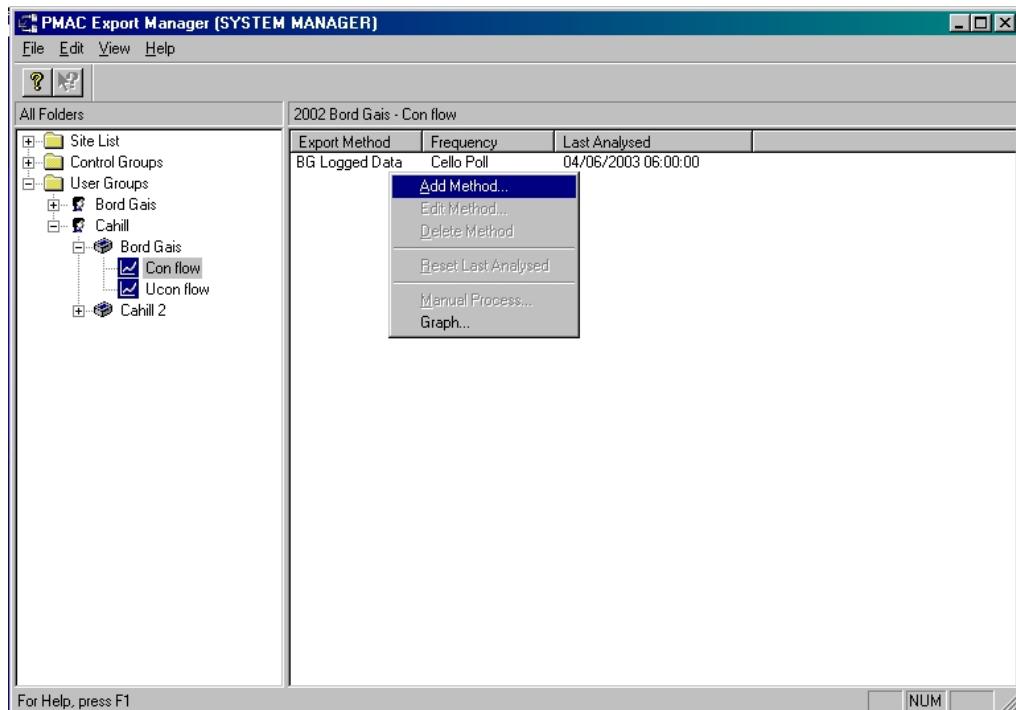
- Select the site in list view in the right hand pane.
- Press the right mouse button and select Delete Site from the popup menu.
- You will be prompted with a message box asking you to confirm the deletion.

Tip

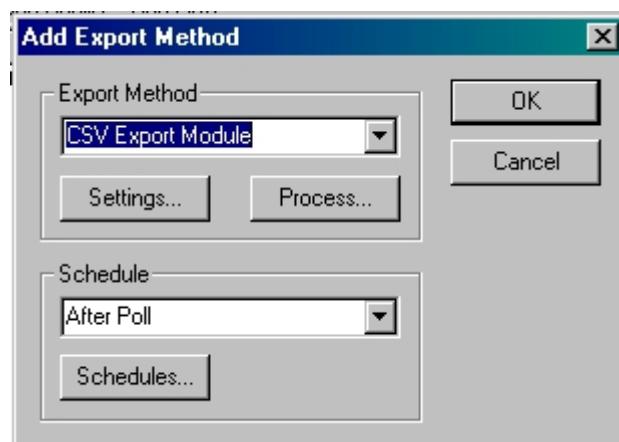
- You must have PMAC in System Manager mode to use this option.

Export Methods

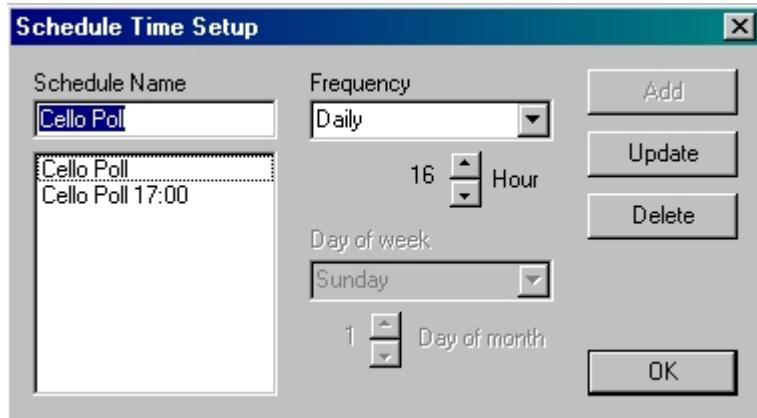
Add an Export Method



- Select the Site and Channel in the tree view on the left-hand pane.
- Move to the list view in the right hand pane and press the right mouse over an away from any Export Methods that are already defined.
- Press the right mouse button and select Add Method... for the popup menu.



- Select the required method from the Export Method list box in the dialog box.



- Select a schedule from Schedules. If no schedules are defined or a new schedule is required then press the Schedule... button.
- Click Ok.

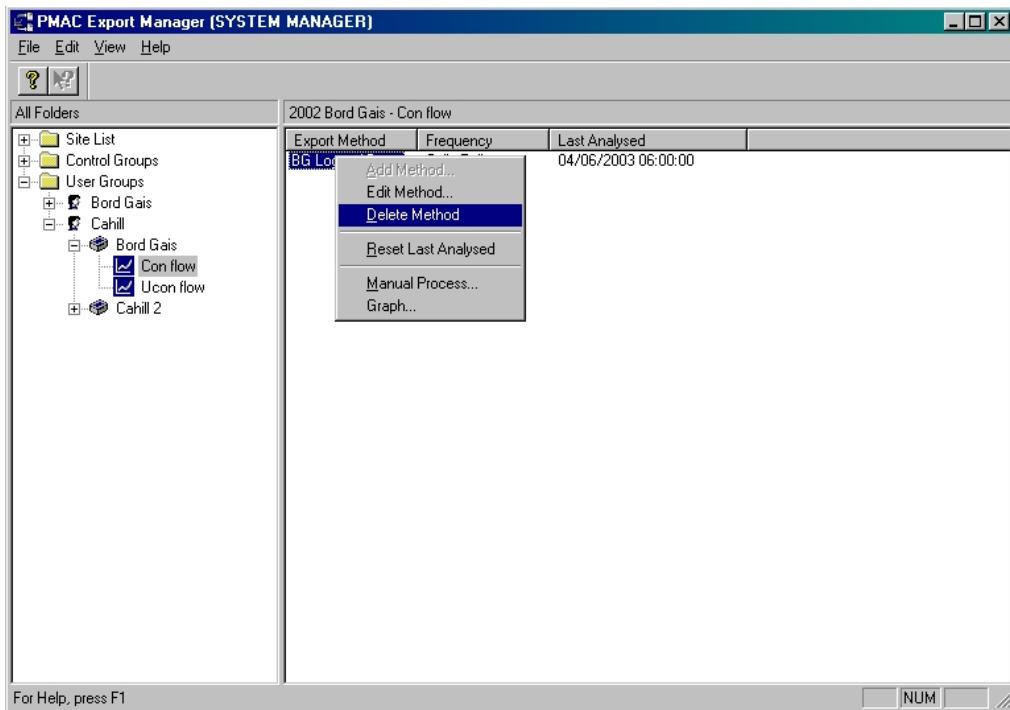
Note

- The settings of the Export Method can be modified from the Add Export Method dialog box by pressing the Settings... button. The options available under Settings... will depend on the type of Export Method.
- The current site and channel can be manually processed by pressing the Process... button. A dialog box will display the manual settings before processing. The options will depend on the type of Export Method.

Tip

- You must have PMAC in System Manager mode to use this option.

Delete an Export Method

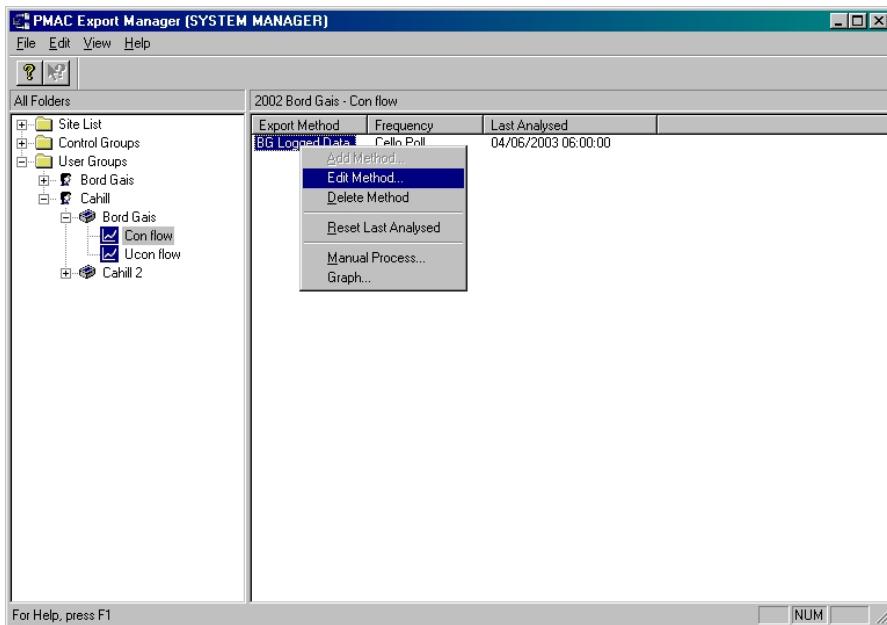


- Select the Export Method you wish to delete from the list view in the right hand pane of the Export Manager Window.
- Press the right mouse button and select Delete from the popup menu.
- You will be prompted with a message box asking you to confirm the deletion.

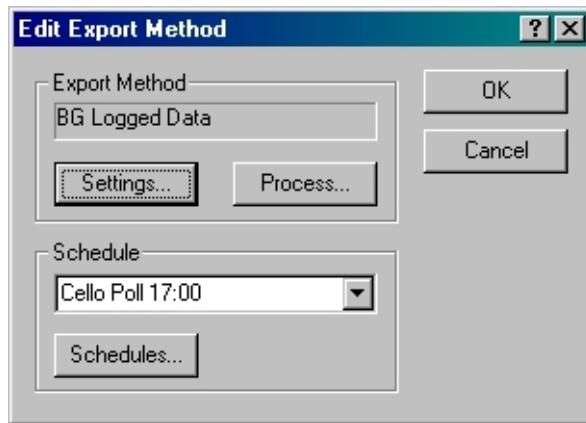
Tip

- You must have PMAC in System Manager mode to use this option.

Edit an Export Method



- Select the Export Method you wish to edit from the list view in the right hand pane of the Export Manager Window.
- Press the right mouse button and select Edit Method... from the popup menu to display the Edit Export Method dialog box.

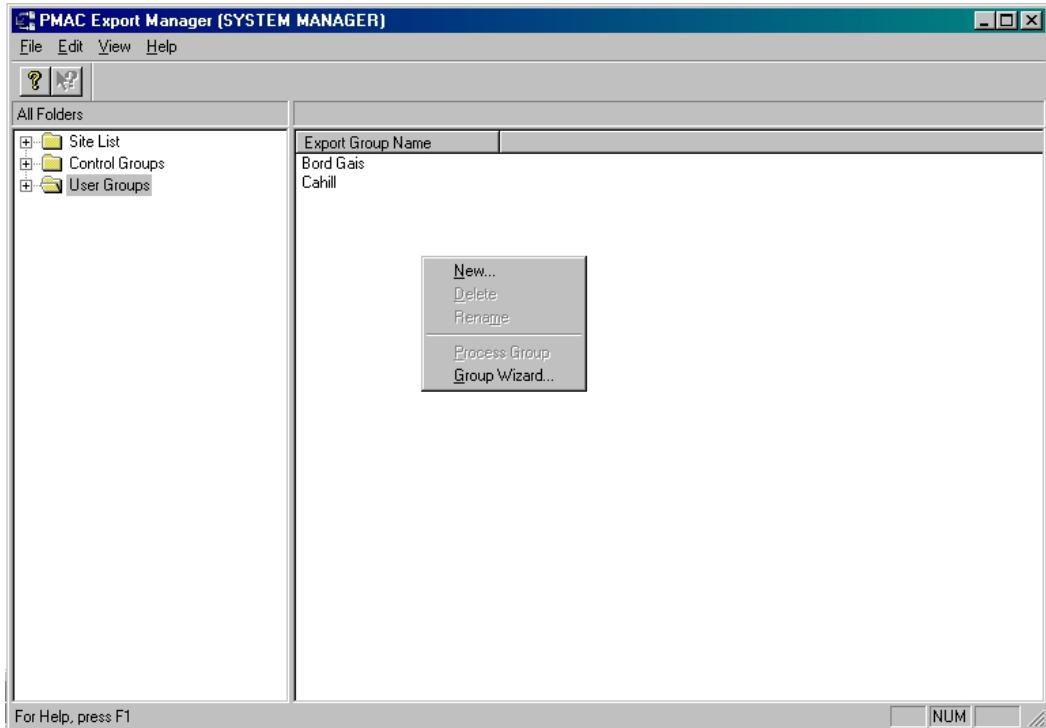


- Pressing the SETTINGS button can modify the Export Method settings. The Export Method settings will depend on the Export Method.
- The schedule can be modified from the Schedule list or pressing the SCHEDULES button can create a new schedule.
- Click OK.

Tip

You must have PMAC in System Manager mode to use this option

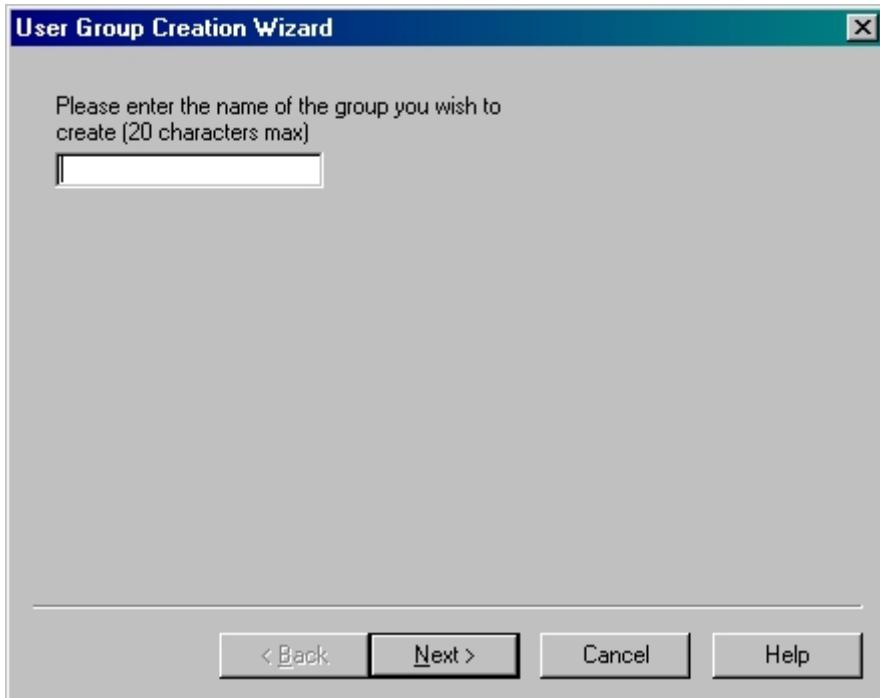
User Group Creation Wizard



The User Group Creation Wizard is a step by step guide to setting up your system for exporting data.

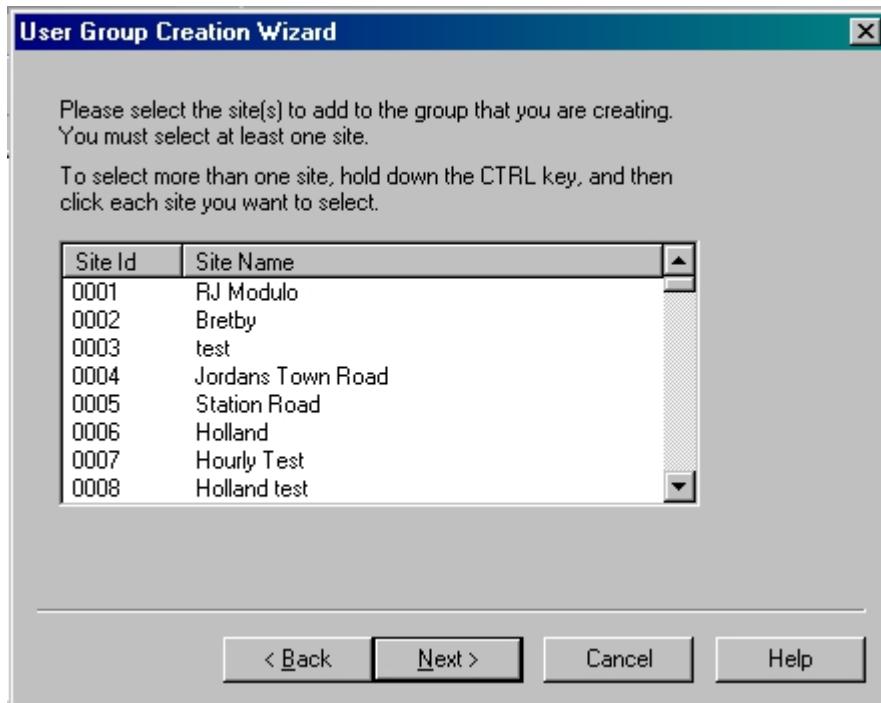
- Entering the User Group Name
- Choosing the Site(s) in the User Group
- Selecting the Export Method(s) and Schedule
- Specifying which Channel(s) to use
- First Step is to select User Group from the right hand pane
- Then left click in the left hand pane
- Then click on the Group Wizard option

Entering the User Group Name



- Enter the name of the User Group you wish to create.
- Click the Next button.

Choosing the Site(s) in the User Group

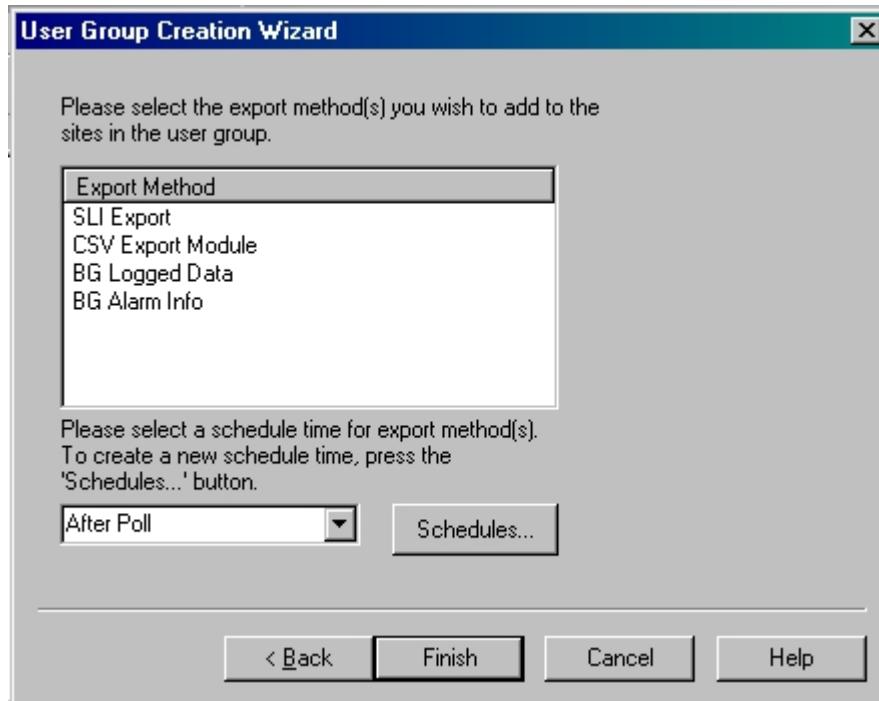


- Select the Site(s) you wish to add to your User Group.
- Click the Next button.

Tip

- To select more than one Site, hold down the CTRL key, and then click the Sites you want.
- To select a range of Sites, select the first Site, hold down the SHIFT, and select the Site at the end of the range.

Selecting the Export Method(s) and Schedule

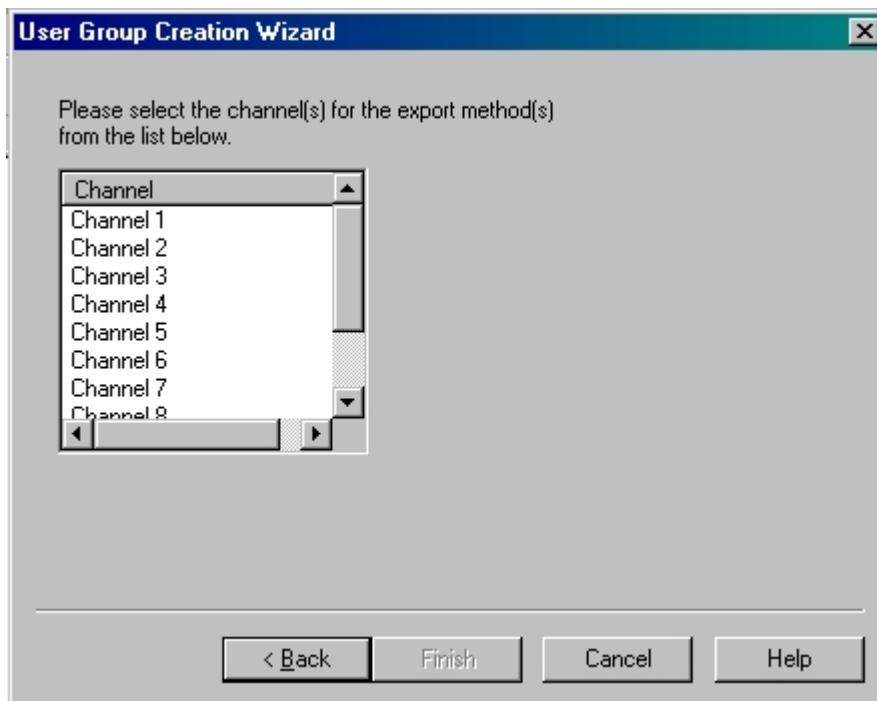


- If you do not wish to choose an Export Method(s) at this point, click the Finish button.
- Select the Export Method(s) you wish to add to your User Group.
- Select the Schedule time for your Export Method(s).
- Click the Next button.

Tip

- To create a new Schedule time, press the SCHEDULE button.
- To select more than one Export Method, hold down the CTRL key, and then click the Export Methods you want.
- To select a range of Export Methods, select the first Export Method, hold down the SHIFT, and select the Export Method at the end of the range.

Specifying which Channel(s) to Use

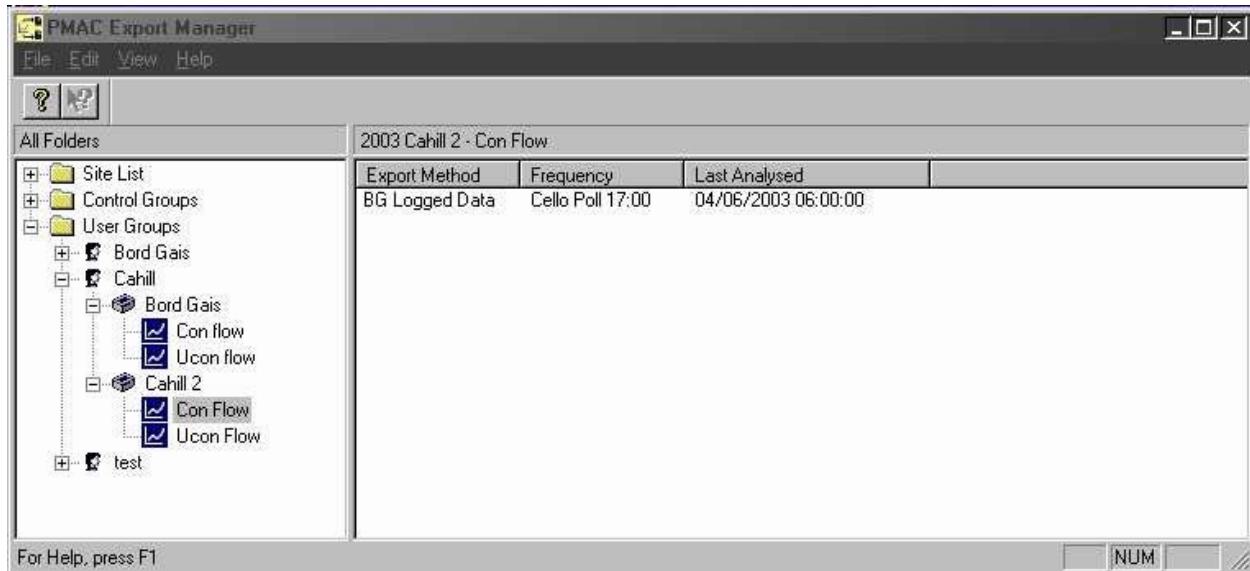


- Select the Channel(s) you wish to use the Export Method(s) on.
- Click the Finish button.

Tip

- To select more than one Channel, hold down the CTRL key, and then click the Channels you want.
- To select a range of Channels, select the first Channel, hold down the SHIFT, and select the Channel at the end of the range.

Results of Group Wizard

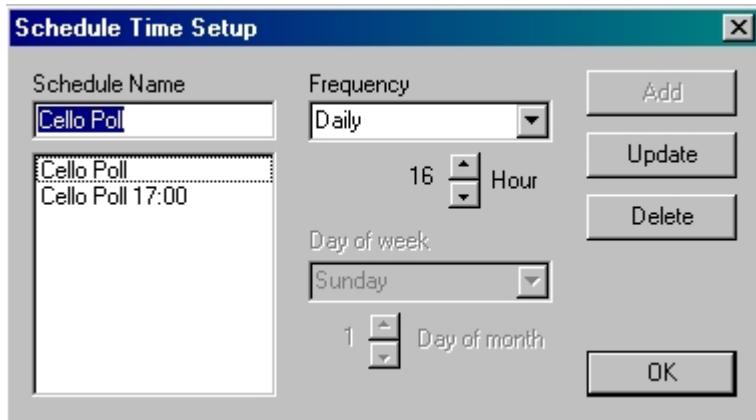


With following the steps above the resultant should be similar to the example above.

Schedule Times

Schedule times are required for use with the Export Manager Scheduler. The Export Manager Schedule will use the Schedule times to perform automatic exports.

Create a New Schedule Time



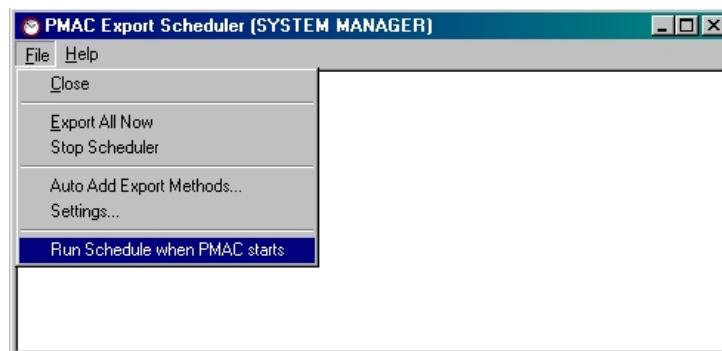
- Select Schedule Times... from the Edit menu.
- Enter a name under Schedule Name.
- Select the required frequency and start times.
- Click the Add button and then click Ok.

Tip

- You must have PMAC in System Manager mode to use this option.

The Schedule Times Setup dialog box can also be access from the Add Export Method and Edit Export Method dialog boxes.

Export Manager Scheduler

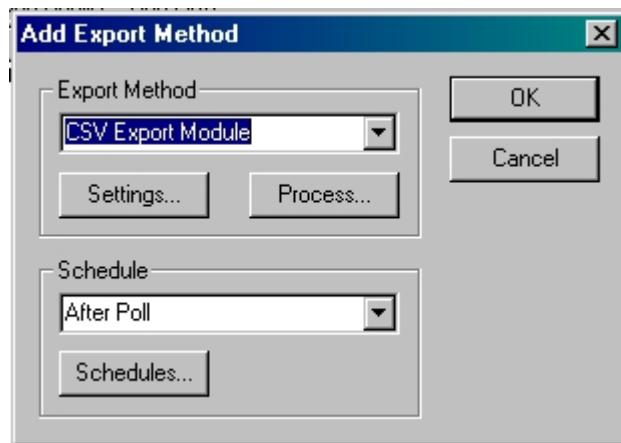


The Export Manager Scheduler is used to perform automatic export at the required time. To ensure that the Export Scheduler runs after the PC has been rebooted, please tick RUN SCHEDULE WHEN PMAC STARTS, as in the example above.

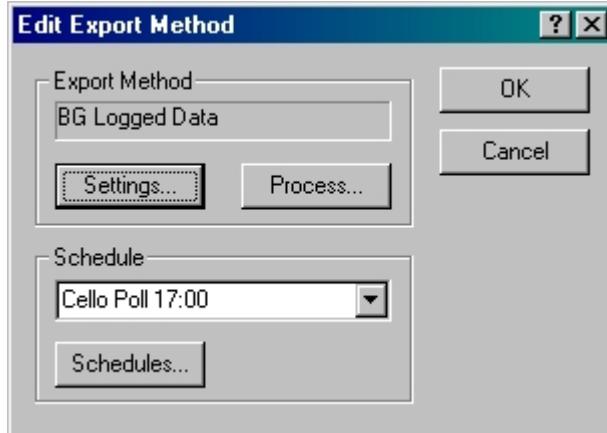
Processing

Manual Processing

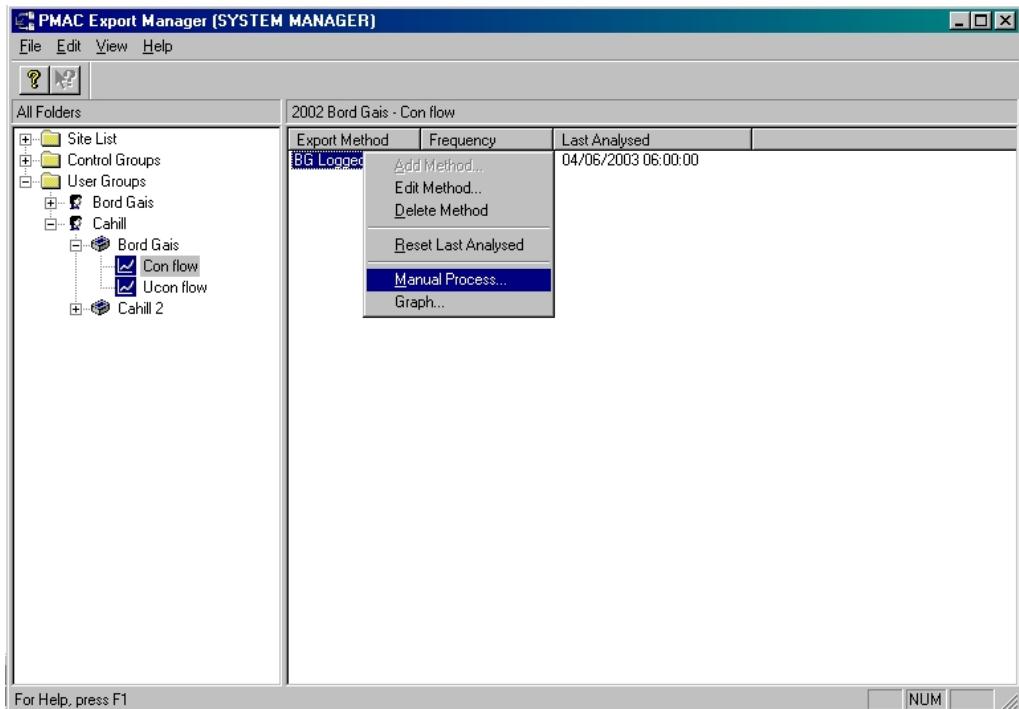
Manual Processing Can Be Performed in One of Three Ways



- Pressing Process... from the Add Export Method dialog box.



- Pressing Process... from the Edit Export Method dialog box.



- Selecting an Export Method, pressing the right hand mouse button and selecting Manual Process...
- The manual settings dialog box for the selected Export Method will be displayed.

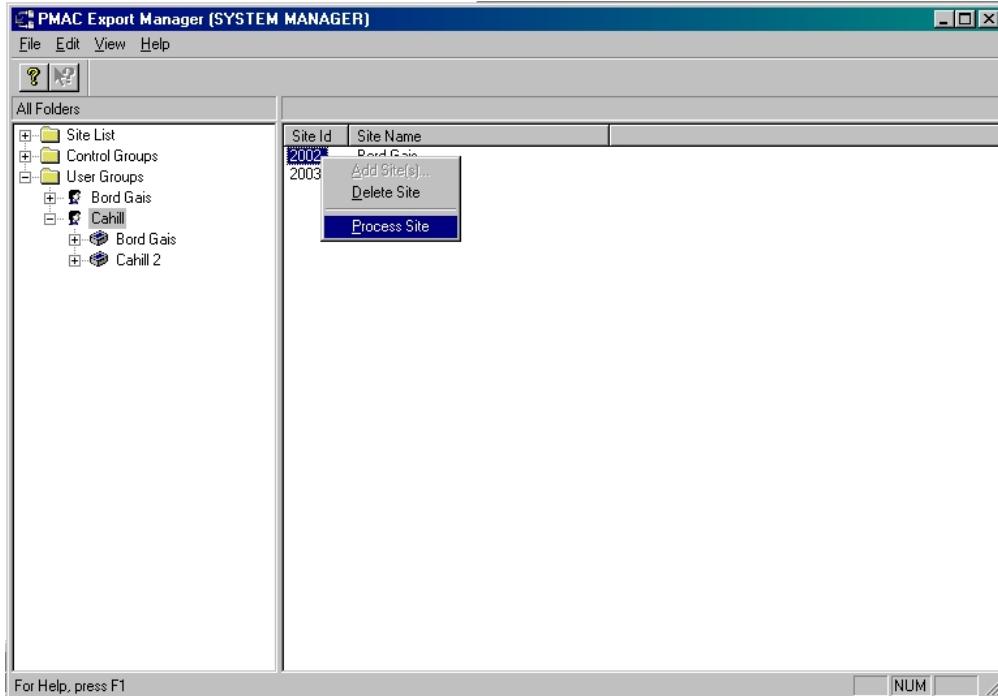
Note

- The manual settings option will depend on the type of Export Method.
- Manual Processing does not modify the last analysed date.

Tip

- You must have PMAC in System Manager mode to use this option.

Process a Site



- Select the Group from under User Groups in tree view on the left-hand pane of the Export Manager.
- Select the required Site in the list view on the right hand pane.
- Press the right mouse button and select Process Site from the popup menu.

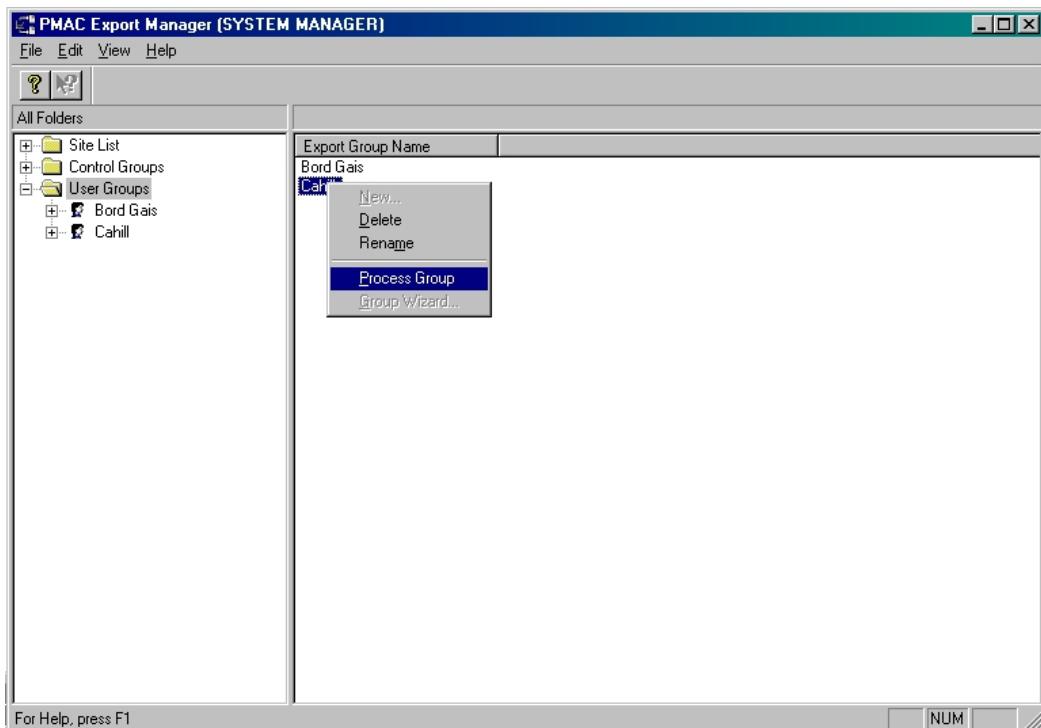
Note

- When a Site is processing, all Export Methods assigned to all channels will attempt to be processed using their assigned settings. If no settings are assigned then the default settings will be used.
- Processing a Site updates the Last Analysed date for all methods exported.

Tip

- You must have PMAC in System Manager mode to use this option.

Process a User Group



- Select the Group from under User Groups in tree view on the left-hand pane of the Export Manager.
- Select the required Group in the list view on the right hand pane.
- Press the right mouse button and select Process Group from the popup menu.

Note

- When a Group is processing, all Export Methods for all channels assigned to sites will attempt to be processed using there assigned settings. If no settings are assigned then the default settings will be used.
- Processing a User Group updates the Last Analysed date for all methods exported.

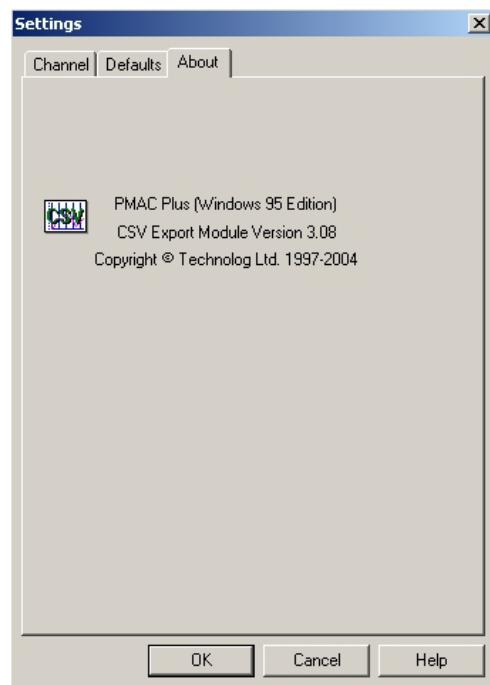
Tip

You must have PMAC in System Manager mode to use this option.

CSV Export Module

Data may be exported as a file to another program for further work.

This function creates a "comma-separated-value" (.CSV) information file. CSV data is in the form of a text file and is accepted by most DOS and Windows spreadsheets.

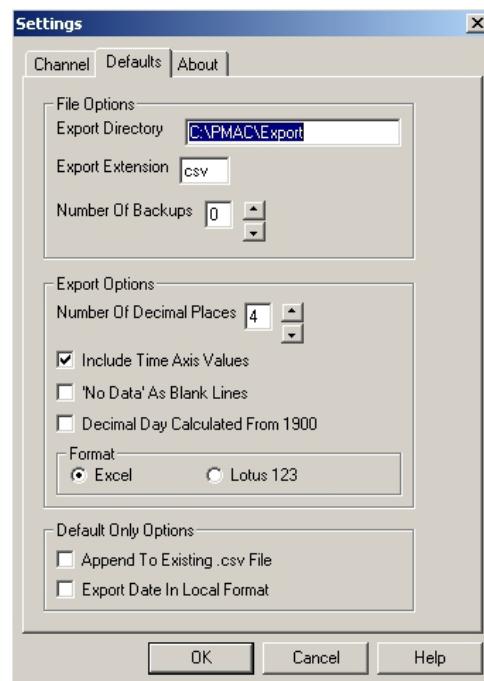


Default Settings

There are options that require setting when the CSV Export module is used for the first time.

These are: -

- Location of the directory into which the export files will be placed on creation.
- Export file extension details
- Number of backups that are to be kept on file.
- Number of decimal places.
- Time Axis Values – This will include a date/time column in the spreadsheet.
- No Data as Blank Lines – If there are any gaps in the data then the spreadsheet will produce a blank in the list of data.



- Decimal Days Calculated from 1900 – This option is best used when recalculating the date with the facilities within the chosen format. (For further information see the example below)
- Choose the format - Excel or Lotus 123.

Note: The default setting will work on all the channels set for export except those overridden by using the Channel Settings which is explained in Channel Settings section below.

An Example of Decimal Days Calculated from 1900

Note: The following is an example of 'Decimal Days Calculated from 1900' processing through Microsoft Excel after the Export File has been created.

After selecting the date in the time axis value column then selecting Format – Cells – Date – and then an appropriate format which includes both the date and time the following results are achieved.

	A	B
7	Time	Flow 2
8	07/10/99	
9	36440.42639	0
10	36440.42778	0
11	36440.42917	0.15
12	36440.43056	0
13	36440.43194	0.15

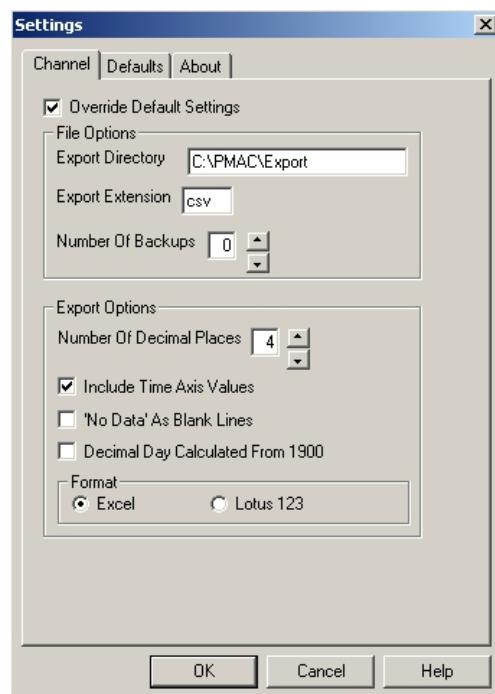
Before

	A	B
7	Time	Flow 2
8	07/10/99	
9	10/7/99 10:14	0
10	10/7/99 10:16	0
11	10/7/99 10:18	0.15
12	10/7/99 10:20	0
13	10/7/99 10:22	0.15

After

Channel Settings

There is the option to setup each channel separately so as to allow the user greater versatility in producing export files. This function is valuable in cases where the exported file is to be stored in a separate directory compared to the others created. The setting up of the individual channel is the same as in section **Default Settings**. To enable this option the user must select **OVERRIDE DEFAULT SETTINGS**.



13 Archiving

Purpose

The archive utility is used to identify and re-locate selected data into a **Temporary Store** (see below), for manual transfer onto removable media and storage away from the computer. This allows old data to be stored for long periods without consuming disk space. Archived data can, if required, be restored to the system.

Temporary Store

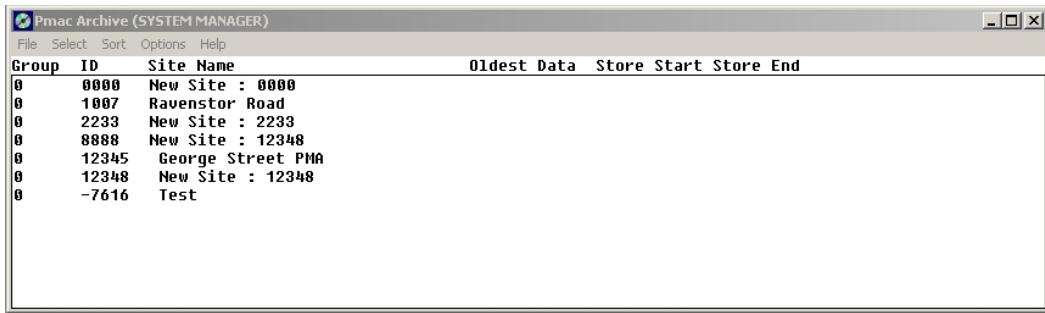
The temporary store is a defined area on the PC's hard disk drive. It has two functions:

- It is used to store data, which is to be copied to removable media (floppy disk, tape streamer etc.)
- Data, which has been restored to the system from archive, is stored here and is read automatically by the Graph program.

Archive Display

To access the Archive function, select ARCHIVE from the UTILS menu in a **PMAC** window.

The **PMAC Archive** window (below) shows information on the files in the system.



Group	ID	Site Name	Oldest Data	Store Start	Store End
0	0000	New Site : 0000			
0	1007	Ravenstor Road			
0	2233	New Site : 2233			
0	8888	New Site : 12348			
0	12345	George Street PMA			
0	12348	New Site : 12348			
0	-7616	Test			

The information displayed in the columns is as follows:

- **Group Number** This column is no longer used.
- **Site ID** PMAC Site ID number that data relates to.
- **Site Name** PMAC Site Name that data relates to.
- **Oldest Data** Oldest data held in Data store.
- **Store Start** Oldest data in Temporary Store.
- **Store End** Newest data in Temporary Store.

Updating the PMAC Archive Window

As data files are accessed and modified, the display becomes out of date. Select EXAMINE STORES from the FILE menu to update the display.

Sorting Sites

The SORT menu offers two Sort options, which enable the displayed list to be configured, as follows:

- Site ID
- Site Name

Archiving Data

To archive data:

1. Select CLEAR STORE from the FILE menu to clear the Temporary Store.
2. Select the Sites to be archived. Sites can be selected by clicking on them in the Archive Display, or by using the following options from the SELECT menu:
 - ALL selects all sites, which have data.
 - BY GROUP selects all sites in a specified group
 - BY TIME selects all sites which have data which is before a time period which is set using the OPTIONS menu (i.e. all sites which need archiving will be selected) - see next step, below.
3. Select TIME from the OPTIONS menu and set the Archive Time. The Archive Time defines the amount of data, which is held in the Main Data Store. Older data will automatically be removed to the Temporary Store. If the store holds data for the last ten months and this time is set to four months, the first six months of data will automatically be extracted to the Temporary Store when the file is selected for archiving - see step 2, above.
4. Select EXTRACT DATA from the FILE menu and extract the required data to the Temporary Store.
5. Manually copy data from the Temporary Store to removable media.

Restoring Archived Data

To restore archived data, copy the appropriate archived files from the removable media into the Temporary Store.

When the **Graph** program is run for the appropriate site and channel, the data will automatically appear in the appropriate place.

Keeping the Temporary Store Tidy

As data is moved into and out of the Temporary Store, the store may become cluttered.

Open the **Archive Display** window to see the status of the store; to update the display, select EXAMINE STORE from the FILE menu.

To delete all files in the Temporary Store, select CLEAR STORE from the FILE menu.

Caution:

The CLEAR STORE command will delete all data in the Temporary Store and should only be used after data has been copied onto the backup device.

14 Troubleshooting

Local Communications Problems

In the event of communication problems while using a locally connected device, carry out the following checks:

- Check that the device (logger, Datamaster, Psion etc.) is properly connected to the PC serial port.
- Check that PMAC is trying to use the correct communications port and transfer speed (usually 1200 baud). This can be checked in the **Communications Settings** dialog in PMAC.
- If using a Newlog, check that the version Number is 3.14 or above.
- If using a Datamaster, check that it is switched on and shows “*READ”, “*LGR BAT”, “*VERSION” or “*OFF” on the display.
- If using a Workabout please ensure that the Remote Link settings are correct before trying communication. For further details refer to the **Dragons User Guide**.
- If this is the first time the logger has been used with PMAC, then check the site database and make sure that the site ID of the logger is not already in use in the database. If it is, then either delete the entry in the site database (and all related files) or change the site ID of the logger to an unused number.
- If the local communications have never worked on the port, then check the windows settings for the port and ensure that the port is working correctly (Control Panel->System->Device Manager for win95+98, or Control Panel->Ports for win NT).

Error Messages

Program Error Messages

Listed below are explanations of some errors that may occur when using PMAC Plus.

If an error occurs, prior to contacting Technolog, please ensure you have a copy of your CONFIG.SYS and AUTOEXEC.BAT files. It is also helpful if you can be close to the PC whilst on the telephone to our support staff.

Error Opening Input File

This error indicates that a PMAC Plus module cannot access a file, e.g. when PMAC Plus is first executed. The module will automatically create a file, and hence the problem should not re-occur, if this error continues to appear, then further investigation may be required. Possible causes include:

- Write protected hard disks, e.g. where PMAC Plus is installed on a network.
- Network conflicts

General Protection Faults

In the event of general protection fault proceed as follows:

- Note the error message, in particular note the module reported as generating the fault.
- Make a record of exactly what happened prior to the fault occurring.
- Close Microsoft Windows, taking care to save files where necessary.

- Check to see if the error is repeatable. Make a record of the results.
- Obtain a hard copy of your PC's CONFIG.SYS and AUTOEXEC.BAT files (they should be in the C:\ directory)
- Contact Technolog and ask for PMAC Plus Technical Support.

Remote Communications Problems

PMAC Communication Alarms (found in the Alarm Log)

ALARM CALL FROM INVALID SITE

Means PMAC has received an incoming call, but the call finished before the ID of the site could be found.

Cause This message can be caused by a variety of things:

- The modem failed to connect to a calling modem (the incoming call may have been from a mis-dial or the PMAC modem may not be setup correctly for incoming calls).
- The modem connected to the calling modem, but the ID of the site could not be found (the PMAC modem is setup to accept alarms from the wrong type of loggers, or the logger is not responding to messages from PMAC).

Remedy

1. Check modem properties to make sure modem is set to wait for alarms from the correct type of logger (E5565 is mostly used for Gas applications, and Technolog GPS protocol is mostly used for Water applications).
2. Check modem properties to make sure that you are using the right type of modem (X.28 PAD for Paknet and Modem for a telephone line).
3. Check modem properties to make sure modem setup string is correct for the type of modem you have (see **Modem Setup Strings**, later in this section for information on how to do this).
4. If you are using a modem, plug a telephone into the line where you received the call and dial 1471 to check if caller was one of your loggers, or a mis-dial.
5. If the problem persists and calls are from one of your loggers, then call the Technolog support desk.

CANNOT SETUP MODEM ON COM<PORT NUMBER>

Means PMAC modem or X.28 PAD has returned an error message in response to modem setup string, or PMAC has received NO response to modem setup string.

Cause This message can be caused by a variety of things:

- Modem or X.28 PAD setup string is wrong.
- Modem or X.28 pad is not plugged into port that PMAC is using for it.
- Modem or X.28 PAD is switched off.

Remedy

1. Check that Modem or X.28 PAD is switched on.
2. Check that Modem or X.28 PAD is plugged into correct communications port on PC.
3. Check that X.28 PAD is connected to aerial, and is registered.
4. Go to Modem Properties, and check that Modem or X.28 PAD is setup for communications on correct port.
5. Check in Modem Properties that Modem or X.28 PAD is using correct setup string. For help on how to check this, see **Modem Setup Strings**, later in this section.
6. Call the Technolog Support Desk.

CANNOT OPEN COM<PORT NUMBER>

and

FAILED TO OPEN COM<PORT NUMBER>

Means PMAC was unable to use the communication port specified in the Modem Properties page.

Cause This message can be caused by a variety of things:

- Communications port does not exist in PC.
- Communications port is being used by another program on PC.
- Communications port is faulty.

Remedy

1. Check that you do not have any other communications software running on PC while running PMAC.
2. Close and re-start PMAC.
3. Check that communications port is present and working correctly. In Windows 95/98/2000 etc go to Device Manager in Windows System Properties program (Control Panel -> System, 'Ports (COM & LPT)' section). In Windows NT check port is available in Control Panel -> Ports section.
4. Call the Technolog Support Desk.

ID MISMATCH (LOGGER = <LOGGER NUMBER>)

Means Logger that you have contacted has a different PMAC ID to the one registered in PMAC.

Cause PMAC has wrong PMAC ID in site database. This could be because logger on site has been changed, or because ID in PMAC site database has been entered in wrongly

Remedy This depends on which PMAC ID is correct. If logger's PMAC ID is incorrect, then go to site database and create a new entry for logger's PMAC ID. You will need to make sure that you copy site details correctly from old site entry. If PMAC site database entry is correct, then you will need to change PMAC ID in logger.

For further help, contact the Technolog Support Desk.

INCOMING CALL ON COM<PORT NUMBER> MODEM, NO CONNECT

Means PMAC has tried to answer an inbound call, but PMAC modem was unable to establish a connection.

Cause This message can be caused by a variety of things:

- The PMAC modem setup string is incorrect.
- Mis-dial accidentally called PMAC PC.
- Calling logger gave-up call before the call connected.

Remedy

1. Check modem properties to make sure that you are using right type of modem (X.28 PAD for Paknet and Modem for a telephone line).
2. Check modem properties to make sure modem setup string is correct for type of modem you have (see **Modem Setup Strings**, later in this section for information on how to do this).
3. If you are using a modem, then plug a telephone into line where you received the call and dial 1471 to check if caller was one of your loggers, or a mis-dial.
4. If the problem persists then call the Technolog support desk.

INCOMING CALL ON COM<PORT NUMBER> MODEM, NO ALARM

Means Logger and PMAC modems connected successfully, but an alarm was not found in logger.

Cause This message can be caused by a variety of things:

- The type of logger is different from type that PMAC is expecting to call.
- There was a communications problem during alarm call.

Remedy

1. Check modem properties to ensure the modem is set to wait for alarms from correct type of logger (Technolog GPS protocol).
2. If the problem persists, call the Technolog Support Desk.

NO ALARM FOUND IN LOGGER

Means Communications with logger worked correctly, but there appeared to be no alarm condition in the logger.

Cause PMAC was unable to find an alarm in the calling logger's memory. This is usually caused by PMAC having incorrect details about the calling logger.

Remedy

1. Update PMAC's copy of logger settings from the logger (Find site in the Site Database, click 'Tools', 'Edit Logger Settings', then click 'File' and 'Update from logger' in Logger Settings Editor).
2. If the problem persists, then call the Technolog Support Desk.

Other PMAC Alarms (found in the Alarm Log)

(Not explained in this document)

'Error creating data file <Data File Name>'
'Error writing header to data file <Data File Name>'
'Error reading header from data file <Data File Name>'
'data type mismatch'
'interval mismatch'
'range mismatch'
'offset mismatch'
'Error seeking end of data file <Data File Name>'
'Error appending gap to data file <Data File Name>'
'Error opening data file <Data File Name>'
'Error seeking end of data file <Data File Name>'
'Error appending to data file <Data File Name>'
'Temp. buffer overflow in logger <Data File Name>'
'Code <Code Number> from logger <Data File Name>' (Code Number is logger generated error code)
'Registry Failure - Failed to allocate memory.'
'Incompatible alarm format <Logger Number>'
'Error <Error Number> attempting to run <Program Name>' (Error Number = Win32 Create Process error return value. Program Name is the name of the program that we're trying to run.)
'Threshold alarm'
'Not enough memory to run <Program Name>'
'Cannot start Comms Handler. Registry Failure.'
'Cannot Register Comms Handler Icon.'
'Cannot Register Alarm Action Icon.'
'Profile not updated for control group'
'Check new profile on control group'
'Failed to start scan program thread.'
'Test Call'
'Error downloading data: <Debug Info>'

For further information on these alarms, please contact the Technolog Support Desk.

PMAC Communication Log Errors (found in the Comms Log)

ABORTED BY USER

Means PMAC to logger communications were stopped by user.

Cause The user pressed 'Cancel', or closed the communications program before the communications were complete.

CARRIER LOST

Means During communications, the two connected modems (or X.28 Pads) lost the connection.

Cause This message can be caused by a variety of things:

- Logger modem has disconnected early.
- There was a fault on the telephone (or radio) network.

Remedy

1. Retry communications.
2. Try re-positioning the logger or PMAC PC radio antenna, and check the signal quality at both ends of the connection (both logger and PC ends). You can check X.28 signal quality by using the Paknet Direct Check service, or by calling the Paknet Help-Desk.
3. If the problem persists, then call the Technolog Support Desk for further assistance.

CONTACT LOST

Means PMAC to logger communications have broken down. PMAC has been unable to get a satisfactory response from logger even after a number of retries.

Cause This message can be caused by a variety of things:

- Logger is not responding to PMAC communications, although modem / X.28 connection has been established.
- If logger is on a GSM modem or X.28 PAD, logger may be in a poor signal-quality area, or there may be temporary signal problems (caused by, for example, atmospheric disturbance).
- PMAC may be using wrong protocol for communications.
- Modems may be connected at wrong baud-rate.
- PMAC may be communicating at wrong speed.

Remedy

1. Retry communications.
2. Check protocol type in PMAC site database ('E5565' is usually used for Gas applications, and 'Technolog GPS' is usually used for Water).
3. Check PMAC communication baud-rate in modem communication setup window (PMAC 'Main Window' -> 'Edit' -> 'Communication Ports', then double-click on modem / X.28 PAD you're

using). Baud-rate is normally '1200' for loggers with land-line modems or X.28 PAD's, but is normally '9600' for loggers with GSM modems.

4. If this is an X.28 PAD or GSM modem connection and some packets were sent and received (you can see this by examining last entries in communications log), then problem is most likely due to poor signal quality. In this case, check signal quality by calling Paknet Direct-Check service, or by calling Paknet Help Desk.
5. If there is poor signal quality on an X.28 or GSM modem connection, then try re-positioning logger or PC antennae.
6. Contact the Technolog Support Desk.

FAILED TO CLOSE PORT

Means PMAC has failed to close a communications port after successful communications.

Cause Either Windows or communications port has failed to work correctly.

Remedy If this problem persists, then contact the Technolog Support Desk.

FAILED TO OPEN COM<PORT NUMBER>

Means PMAC was unable to open the communications port.

Cause This message can be caused by a variety of things:

- Communications port does not exist in PC.
- Communications port is being used by another program on PC.
- Communications port is faulty.

Remedy

1. Check that you do not have other communications software running on PC while running PMAC.
2. Close and re-start PMAC.
3. Check that communications port is present and working correctly. In Windows 95/98/2000 etc go to Device Manager in Windows System Properties program (Control Panel -> System, 'Ports (COM & LPT)' section). In Windows NT check port is available in Control Panel -> Ports section.
4. Call the Technolog Support Desk.

INCOMING CALL ON COM<PORT NUMBER> MODEM, NO ALARM

Means Logger and PMAC modems connected successfully, but an alarm was not found in logger.

Cause This message can be caused by a variety of things:

- Type of the logger is different to type that PMAC is expecting to call.
- There was a communications problem during alarm call.

Remedy

1. Check modem properties to ensure modem is set to wait for alarms from correct type of logger (Technolog GPS protocol).
2. If the problem persists, call the Technolog Support Desk.

INCOMING CALL ON COM<PORT NUMBER> MODEM, NO CONNECT

Means There has been an inbound call that PMAC has tried to answer, but PMAC modem was unable to establish a connection.

Cause This message can be caused by a variety of things:

- PMAC modem setup string is incorrect.
- A mis-dial accidentally called PMAC PC.
- Calling logger gave-up call before call connected.

Remedy

1. Check modem properties to make sure that you are using right type of modem (X.28 PAD for Paknet and Modem for a telephone line).
2. Check modem properties to make sure modem setup string is correct for type of modem you have (see **Modem Setup Strings**, later in this section for information on how to do this).
3. If you are using a modem, then plug a telephone into the line where you received the call and dial 1471 to check if caller was one of your loggers, or a mis-dial.
4. If the problem persists then call the Technolog support desk.

LOCAL LOST

Means During local communications, PMAC was unable to get a valid reply from logger, even after retries.

Cause This message can be caused by a variety of things:

- PMAC is using wrong protocol for connected logger.
- The logger was disconnected before the communications were complete.

Remedy

1. Check logger is connected to PC correctly.
2. Check PMAC is using right protocol (go to the Site Database, and check that protocol for this logger is correct. E5565 protocol is usually used in Gas applications, and Technolog GPS protocol is normally used for Water).
3. If the problem persists, then call the Technolog Support Desk.

NO ALARM FOUND IN LOGGER

Means Communications with logger worked correctly, but there appeared to be no alarm condition in logger.

Cause PMAC was unable to find an alarm in the calling logger's memory. This is usually caused by PMAC having incorrect details about the calling logger.

Remedy

1. Update PMAC's copy of logger settings from logger (Find site in Site Database, click 'Tools', 'Edit Logger Settings', then click 'File' and 'Update from logger' in Logger Settings Editor).
2. If the problem persists, then call the Technolog Support Desk.

NO NUMBER!

Means PMAC was unable to find telephone number for logger in site database.

Cause This is caused by leaving telephone number field in site database blank.

Remedy Open Site Database (PMAC 'Main Window' -> 'Utils' -> 'Site Database'), find site that you're trying to call and enter correct telephone number for logger.

NO RESPONSE

Means PMAC was unable to connect to logger, and no specific information was returned about failure by modem / X.28 PAD.

Cause This message can be caused by a variety of things:

- Modem is switched off.
- Modem is not connected to PC.
- Modem is not configured correctly.
- Modem is not connected to telephone line.
- Communications port is not functioning correctly.
- PMAC has wrong telephone number for logger.

Remedy

1. Check that modem / X.28 PAD is powered and switched on.
2. Check that modem / X.28 PAD is properly connected to right communications port on PC.
3. Check that modem / X.28 PAD is configured correctly (go to communications settings in PMAC and make sure that port and modem setup are correct). Go to PMAC 'Main Window' -> 'Edit' -> 'Communication Ports', find correct modem / X.28 PAD and double-click on it. Check that "Modem", "Modem Setup" and "predial" are correct.
4. If this is a modem, check that it is connected to telephone line, and that telephone line works (plug a phone in and dial a number that you know).
5. If this is a X.28 PAD, check that it is plugged into a working antenna, and that PAD is properly registered (see registration process).
6. Check that PMAC is using correct telephone number for logger (go to PMAC 'Main Window' -> 'Utils' -> 'Site Database', and find logger site. Check telephone number is correct).
7. If this is a X.28 PAD, and you are not sure that PAD is properly registered, then call PAKNET Help Desk.
8. If this problem persists, then call the Technolog Support Desk.

PAGE FAILED

Means PMAC failed to call pager on a pager-powered logger site.

Cause This message can be caused by a variety of things:

- Pager number is wrong.
- PMAC pager support is setup incorrectly.

Remedy

1. Check in Site Database that pager number is correct (please ensure that there are NO SPACES in pager number). To do this, go to PMAC 'Main Window' -> 'Utils' -> 'Site Database', then find correct site and check pager number is correct.
2. If this is for communications via a Modem, then check pager service type is correct, and that timeouts are correct (go to 'PMAC Main Window' -> 'Edit' -> 'Communication Ports' -> 'Global'(Tab), and make sure that Pager enable is set, and Dial-Out group is right (a modem dial-out group). 'Duration' is usually 20 seconds, and 'delay' is 120 seconds).
3. If you are paging via an X.28 PAD, then go to pager service settings (see just above), and make sure dial-out group is 'X.28 Pads', and that 'Destination NUA' is set to '23533399130017'.

OK (TIMEOUT)

Means PMAC has completed communications with logger, and activity timeout occurred.

Cause While viewing logger settings, user didn't communicate with logger for a minute. To save telephone costs, communications driver disconnected call.

Modem Error Messages (found in the comms log)

BLACKLISTED

Means Modem has returned this error message in response to a dial command.

Cause Modem has decided that PMAC has retried telephone number too many times, and that number is now unobtainable for 2 hours. This only happens on a few modems and then only after (probably) seven unsuccessful attempts to dial a site.

Remedy

1. You need to make the modem forget unsuccessful dial attempts. The best way to do this is usually to power-cycle modem (turn it off for a bit, then turn it back on).
2. Check that you are dialling right number (In Site Database, find site you are calling and verify that number is correct).
3. If you are calling out through a company exchange, check that your pre-dial number is correct (this is usually '9' to get an outside line).
4. Try plugging a telephone into modem line to see if you can contact site (you should hear modem tones from logger).
5. If the problem persists, then contact the Technolog Support Desk.

BUSY

Means Modem has reported this error in response to a dial command.

Cause The logger telephone line is busy.

Remedy

1. Wait for a few minutes, and then try communications again.
2. Check that you are dialling correct number.
3. Try plugging a telephone into modem line and calling the site (to see if you get busy tone).
4. If the problem persists, then contact the Technolog Support Desk.

ERROR

Means Modem did not understand a command sent by PMAC.

Cause This message can be caused by a variety of things:

- Modem setup string is wrong.
- Modem is not Hayes (AT command set)-compatible.

Remedy

1. Check that modem setup string is correct (see **Modem Setup Strings**, later in this section for information on how to do this).
2. If this problem persists, then call Technolog Support Desk.

NO ANSWER

Means Logger's modem failed to answer PMAC call.

Cause This message can be caused by a variety of things:

- PMAC is calling wrong number.
- Logger modem is not ready to receive incoming calls.
- There is a telephone network problem.

Remedy

1. Retry communications a few times, leaving a gap of 1 – 2 minutes between each attempt.
2. Check that PMAC is using correct number for logger. To do this, go to Site Database and find logger's site. You may also need to check modem's pre-dial number if you are calling out through office exchange.
3. If the problem persists, then call the Technolog Support Desk.

NO CARRIER

Means PMAC modem was unable to negotiate a connection with logger's modem.

Cause This message can be caused by a variety of things:

- PMAC dialled wrong number.
- Modem setup string is not correct.

Remedy

1. Retry communication.
2. Check that PMAC is calling correct telephone number. To do this, find logger's site in the Site Database and check telephone number field is correct.
3. Check that PMAC modem setup string is correct (see **Modem Setup Strings**, later in this section for information on how to do this).
4. If the problem persists, then call the Technolog Support Desk.

NO DIAL TONE

Means Modem was unable to recognise a dial tone on telephone line.

Cause This message can be caused by a variety of things:

- Modem is not connected to telephone line.
- There is something wrong with telephone line, modem or modem-PC cable.
- PMAC modem setup string is incorrect.

Remedy

1. Retry communication.
2. Check that modem is properly connected to PC, power and telephone connections.
3. Check that no other devices are using telephone line at same time as PMAC.
4. Try plugging a telephone into modem telephone socket, and see if you can call a number that you know.
5. Check if you can use any other communications software with modem.
6. (If you can do 5) Check PMAC modem setup string is correct (see **Modem Setup Strings**, later in this section for information on how to do this).
7. If the problem persists, then call the Technolog Support Desk.

Paknet Error Messages (found in the comms log)

'CLR NAC 145'

and

'CLR NAC 161'

Means Time-Out – Call has timed-out due to no activity on X.28 connection for 3 minutes.

Cause This should not happen with normal use of PMAC.

Remedy If this problem persists, then call the Technolog Support Desk.

CLR NAC 149

Means Invalid Address – PMAC has called an invalid telephone number.

Cause PMAC is using wrong number for site.

Remedy 2. Check telephone number for site. To do this, go to Site Database and check that telephone number (or NUA) for site is correct. Number should be of following format: "23533900<Logger's Radio-PAD NUA>".

1. If the problem persists, then call the Technolog Support Desk.

CLR DTE 152

Means Access Barred – Paknet Radio Pad address is not valid.

Cause Paknet Radio Pad has not been registered.

Remedy

1. Register Paknet Radio Pad.
2. Call Paknet Helpdesk.
3. Call Technolog Support Desk.

CLR NAC 169

Means Failed to transmit packet to Paknet Radio Pad.

Cause Radio link to Base Station is weak or suffering from interference.

Remedy

1. Re-position the aerial to improve the signal.
2. Call Paknet Helpdesk.
3. Call Technolog Support Desk.

CLR DTE 171

Means	Paknet Radio-Pad is engaged.
Cause	This message can be caused by a variety of things: <ul style="list-style-type: none">• PMAC is using the wrong telephone number.• The radio-pad connected to the logger is currently on-line to another user.
Remedy	<ol style="list-style-type: none">1. Call the site later after a delay.2. Contact Paknet Helpdesk.3. Call Technolog Support Desk.

CLR DTE 172

Means	No radio contact on call setup – the logger is not contactable.
Cause	This message can be caused by a variety of things: <ul style="list-style-type: none">• The PMAC telephone number for the site is wrong.• The logger's radio-PAD failed to power-up.• On pager-powered systems, the pager failed to activate.• The logger's Radio-PAD battery is flat.• The logger's Radio-PAD has a weak signal.
Remedy	<ol style="list-style-type: none">1. Retry communications.2. Check telephone number for site. To do this, go to Site Database and check that telephone number (or NUA) for logger is correct. Number should be of following format: "23533900<Logger's NUA>".3. If this is a pager-powered system, check that pager number is correct. Go to Site Database and check that Pager Number is correct. Please take care to ensure that there NO spaces between numbers.4. If this is a pager-powered system, then check that paging support is enabled and configured correctly. Go to 'Edit' -> 'Communications Ports' -> 'Global tab' and make sure that 'Call Pager Enable' is ticked, 'Dial-out Group' is set to 'X.28 Pads' and 'Destination NUA' is set to '23533399130017'. Retry communications a couple of times.5. If this is a permanently powered logger and radio-pad, call Paknet Direct-Check service using Logger's Radio-PAD ESN (Serial Number). This will tell you if logger is contactable.6. If this is a pager-powered system, then you will need to call Logger's Pager first with a telephone, about 1.5-2 minutes before using Direct-Check service. This will tell you if power system is working or not. If NOT, then most likely cause is a flat battery.7. If this is a pager-powered system, then you may be able to check battery voltage in PMAC. Go to Site Database, find site that you tried to call, click on Graph icon and choose battery voltage channel (probably channel 2). Check last few values for voltage. If voltage is close to 11 Volts, then battery needs to be changed.8. If the problem persists, then call the Technolog Support Desk.

CLR PAD 212

Means	Blacklisted -Radio-PAD is limiting number of unsuccessful calls made from PAD.
Cause	PMAC making a large number of unsuccessful call attempts to a site.
Remedy	<ol style="list-style-type: none">1. You should find out what caused unsuccessful communications and fix that problem first.2. To clear Blacklisting, simply power-cycle Radio-PAD (switch it off for a bit, then on again).3. If the problem persists, then contact the Technolog Support Desk.

CLR PAD 225

Means	Time-out - call has timed-out after inactivity for 3 minutes.
Cause	This should not happen with normal use of PMAC.
Remedy	If this problem persists, then call the Technolog Support Desk.

CLR PAD 234

Means	Failed to transmit data to Base-Station.
Cause	Poor radio signal quality to Base-Station.
Remedy	<ol style="list-style-type: none">1. Re-position aerial of Radio-PAD connected to PMAC PC for a better signal.2. Contact Paknet Helpdesk.3. If the problem persists, contact the Technolog Support Desk.

CLR PAD 245

Means	Destination address not connected to DTE – The radio-pad doesn't think that anything is attached to it.
Cause	This message can be caused by a variety of things: <ul style="list-style-type: none">• Telephone number that PMAC has called is wrong.• Logger is not properly wired to radio-pad.• Radio-pad faulty.
Remedy	<ol style="list-style-type: none">1. Check that telephone and pager numbers in PMAC are correct (to do this, go to 'Site Database' and find site that you were trying to call and verify that numbers it's dialling are correct).2. Call the Technolog Support Desk.

CLR PAD 252

Means	PRN Unavailable – Paknet Radio-PAD is not in service.
Cause	Paknet PAD is not synchronised to a Base Station.
Remedy	<ol style="list-style-type: none">1. Check the aerial is connected and reposition it if necessary to get a better signal.2. Re-Commission radio-pad.3. Call the Paknet Helpdesk for further assistance.

CLR ERR

or

ERR

Means Radio-Pad (or Dynatech PAD) did not understand the command sent to it.
Cause This message can be caused by a variety of things:

- Radio-PAD setup string was wrong.
- Logger Telephone Number in Site Database is wrong.
- There is a problem with Radio / Dynatech PAD.

Remedy

1. Check that telephone and pager numbers in PMAC are correct (to do this, go to 'Site Database' and find site that you were trying to call and verify that numbers it's dialling are correct). Then retry communication.
2. Check PMAC modem setup string is correct (see **Modem Setup Strings**, later in this section for information on how to do this). Then retry communication.
3. Contact Paknet Helpdesk for further assistance.

Paknet Error Messages (complete list)

This is a full list of Paknet error messages and their meanings. For troubleshooting those error messages not already covered by the rest of this manual, you should contact the *Paknet Help Desk*: (01635) 502595.

MOST COMMON X.28 ERROR CODES AND PROBLEMS

X.28 submode supports a large quantity of error messages and throughout this section all problems will be detailed and explained. This following section will deal with the common error codes and problems that might be faced when using X.28 and any remedial action that might be used to clear the problem.

ERROR TYPES AND THE MOST COMMON ERRORS

The standard error codes in X.28 will be output from the Paknet Radio-Pad port in the format CLR XXX YYY with XXX representing an ASCII character and YYY representing a number.

XXX this represents the clear cause and gives an indication as to which part of the network the problem lies in (see **Clear Causes**, later in this section), e.g. the Paknet Radio-Pad, the radio link, the destination device, etc.

YYY this represents the clear diagnostic code which is a unique reference number for a specific error (see **Diagnostic Codes**, later in this section).

The following information is for user evaluation and displays the most common error messages received when using the X.25 network. All codes are displayed on a PC or SSM2/3 test meter.

CLR XXX	CLR YYY		Explanation	Possible remedy / actions
NP NAC	067 149	Invalid Address	Destination address incorrectly supplied.	Check address being called.
DTE	152	Access Barred	Paknet Radio-Pad address not valid.	Register Paknet Radio-Pad. Call customer services.
NAC NAC	161 145	Time-out	Call has timed-out no activity on radio-link for 3 minutes.	Design feature. Exercise radio-link to maintain radio contact or proceed with call setup.
NAC	169	Failed to transmit packet to Radio-Pad	Radio link to base-station is weak or suffering from interference.	Re-position aerial to improve signal.
DTE	171	Paknet Radio-Pad port engaged	Destination port on Paknet Radio-Pad presently engaged.	Try calling later, after a delay. If this doesn't work, call customer services.
DTE	172	No radio contact on call setup	Destination address is not contactable.	Destination Pad is being addressed through the wrong base station, is switched off or has a weak signal.
PAD	212	Blacklisted	Paknet Radio-Pad software limiting repeated unsuccessful calls.	Contact Vodafone Data Network.
PAD	225	Time-out	Call has timed out (due to no activity on the link for 3 minutes).	Design feature. Destination address may be incorrect.
PAD	234	Failed to transmit packet to NAC	Explanation as above.	Re-position aerial to improve signal.
DTE	245	Link Failure	Destination address not connected to DTE. DTR in low state.	Ensure destination address is correct.
PAD	252	PRN unavailable	Paknet Radio-Pad is not in service. Not synchronised to a base station.	Re-position/connect aerial. Carry out commissioning procedures.

CLEAR CAUSES

This table shows all the clear cause indicators used in the error codes on the network. If a Paknet Radio-Pad is used then it automatically translates the decimal clear cause into an ASCII string. However, if the clear cause is not translated into an ASCII string, the CLR message will still appear to denote that it is an error message.

1 Clear Cause			Clear Information
CLR XXX	Decimal	[Hex]	
Paknet Radio-Pad Connection			
DTE	0	[0]	X.25 Clearing Cause Codes
DTE	128-255	[80-ff]	DTE originated DTE originated
OCC	1	[1]	Number Busy
INV	3	[3]	Invalid Call
NC	5	[5]	Network Congestion
DER	9	[9]	Out of Order
NA	11	[b]	Access Barred
NP	13	[d]	Not obtainable
RPE	17	[11]	Remote Procedure Error
ERR	19	[13]	Local Procedure Error
DER	21	[15]	RPOA out of order
RNA	25	[19]	Reverse charging not subscribed
NP	33	[21]	Incompatible destination
INV	41	[29]	Fast select not subscribed
NP	57	[39]	Ship absent
			PRN Codes
NAC	112	[70]	NAC originated
PAD	113	[71]	Paknet Radio-Pad originate
			Symicron X.25 Sourced Codes - These clear causes are on the X.25 general network and so have no ASCII representation. The decimal clear cause will appear instead if a Paknet Radio-Pad is used.
	50	[80]	Connection on CID other than 0x0f.
	51	[81]	No listen buffers available.
	52	[82]	Error code 52 should never appear.
	53	[83]	Packet received on invalid CID – abort sent.

DIAGNOSTIC CODES

The following information covers a comprehensive list of X.28 error codes output by the Paknet Radio-Pad as a clear cause with the format CLR XXX YYY. The decimal values in these tables correspond to YYY.

Diagnostic Code		Clear Information
Decimal	Hex	
143	[8f]	<p>NAC General Codes – A NAC is one (duplicated) half of a Base Station.</p> <p>System Shutdown</p>
		<p>NAC ROU Sourced Codes – Codes in this group are related to the ability of the NAC to internally route a call, with regard to available resource or constraints inherent in management data within the call structure.</p>
144	[90]	No sessions available
145	[91]	Time-out
146	[92]	Session no longer active
147	[93]	Inter-task procedural error
148	[94]	Internal processing error
149	[95]	Invalid address
150	[96]	Facilities not subscribed
151	[97]	Invalid facility requested
152	[98]	Access barred
153	[99]	Max session bytes exceeded
154	[9a]	Max session time exceeded
155	[9b]	Max circuits for CUG exceeded
156	[9c]	Bad destination circuit number – internal error
157	[9d]	Destination link not active
158	[9e]	Management forced clear
159	[9f]	Reserved for future allocation
		NAC PRN Sourced Codes – Codes in this group are related to the way errors are handled in the on-air (radio) protocol.
160	[a0]	No sessions available
161	[a1]	Time-out
163	[a3]	Inter-task procedural error
164	[a4]	Internal processing error
165	[a5]	Invalid PRN packet format
166	[a6]	Invalid PRN packet for current state
167	[a7]	Invalid PRN P[R] received
168	[a8]	Invalid PRN P[S] received
169	[a9]	Failed to transmit packet to Radio-Pad
170	[aa]	Invalid address
171	[ab]	Paknet Radio-Pad port engaged
172	[ac]	No radio contact on call setup
175	[af]	Broadcast completed
176	[b0]	Reset by Paknet Radio-Pad
177	[b1]	New Call request from Paknet Radio-Pad
178	[b2]	Radio contact made – no call setup
179	[b3]	Lost radio contact
162 & 173-174	[a2 & ad-ae]	Reserved for future allocation

Diagnostic Code		Clear Information
Decimal	Hex	
		NAC PSN Sourced Codes – Codes in this group are related to the way errors are handled in the packet switched network protocol.
180 181 183 184 185 186 187 182 & 188- 189	[b4] [b5] [b7] [b8] [b9] [ba] [bb] [b6] & [bc- bd]	No sessions available Time-out Inter-task procedural error Internal processing error X.25 inactive X.25 interface error Invalid use of fast select Reserved for future allocation
190 191 193 194 195 196 192 & 197- 199	[be] [bf] [c1] [c2] [c3] [c4] [c0] & [c5- c7]	NAC MAN (manager) Sourced Codes No sessions available Time-out Inter-task procedural error Internal processing error No command process Invalid address Reserved for future allocation
200 201 202-207	[c8] [c9] [ca-cf]	NAC TER (terminal) Sourced Codes No sessions available Time-out Reserved for future allocation
208-211	[d0-d3]	NAC INL Sourced Codes – The codes in this group are related to the Internet link. Reserved for future allocation

		Paknet Sourced Codes	Radio-Pad	Manager
212	[d4]			
213	[d5]	Blacklisted		
214	[d6]	Call gapped		
215	[d7]	Outgoing calls barred		
216-219	[d8-db]	Incoming calls barred		
220	[dc]	Reserved for future allocation		
221	[dd]			
222	[de]	Time-out		
223	[df]	Session no longer active		
224	[e0]	Inter-task procedural error		
225	[e1]	Internal processing error		
226	[e2]	Out of buffers		
227	[e3]	Time-out		
228	[e4]	Session not available		
229	[e5]	Session already active on call setup		
230	[e6]	Inter-task procedure error		
231	[e7]	Internal processing error		
232	[e8]	Invalid PRN packet format		
233	[e9]	Invalid PRN packet for current state		
234	[ea]	Invalid PRN P[R] received		
235	[eb]	Invalid PRN P[S] received		
236	[ec]	Failed to transmit packet to NAC		
237	[ed]	No radio contact on call setup		
238	[ee]	NAC synchronisation lost		
239	[ef]	Encryption not supported		
		Invalid NUA		
		Incoming call received from NAC		

Diagnostic Code		Clear Information
Decimal	Hex	
		Paknet Radio-Pad PNC Sourced Codes – Codes in this group are related to the serial ports on the Paknet Radio-Pad.
240	[f0]	Time-out
241	[f1]	Session not available
242	[f2]	Session already active on call setup
243	[f3]	Inter-task procedure error
244	[f4]	Internal processing error
245	[f5]	Link failure
246	[f6]	Call clash – Incoming/Outgoing EFTPoS
247	[f7]	Spare
248	[f8]	Service unavailable
249	[f9]	Serial port overrun error
250	[fa]	Serial port parity error
251	[fb]	Broadcast time-out
		General Paknet Radio-Pad Codes
252	[fc]	PRN unavailable
253	[fd]	PRN overrun error
254-255	[fe-ff]	Reserved for future allocation

FIXED X.25 NETWORK DIAGNOSTIC CODE FIELDS

The fixed X.25 Network Diagnostic Code Fields are the error codes that appear on the general X.25 network and are not Vodafone Data Network specific.

Code		Meaning
Decimal	Hex	
00	[00]	No additional information
01	[01]	Invalid P[S] (send sequence)
02	[02]	Invalid P[R] (receive sequence)
16-29	[10-1D]	Packet Type Invalid
48	[30]	Timer expired
49	[31]	Timer expired for incoming call
50	[32]	Timer expired for clear indication
51	[33]	Timer expired for reset indication
52	[34]	Timer expired for restart indication
64	[40]	Call setup, clearing or registration problem
65	[41]	Facility code not allowed
66	[42]	Facility parameter not allowed
67	[43]	Invalid called address
68	[44]	Invalid calling address
69	[45]	Invalid facility length
70	[46]	Incoming call barred
71	[47]	No logical channel available
72	[48]	Call collision
73	[49]	Duplicate facility requested
74	[4A]	Non zero address length
75	[4B]	Non zero facility length
76	[4C]	Facility not provided when expected
77	[4D]	Invalid CCITT-specified DTE facility
112	[70]	Internetwork problem
113	[71]	Remote network problem
114	[72]	Internetwork protocol problem
115	[73]	Internetwork link out of order
116	[74]	Internetwork link busy
117	[75]	Transit network facility problem
118	[76]	Remote network facility problem
119	[77]	Internetwork routing problem
120	[78]	Temporary routing problem
121	[79]	Unknown called DNIC
122	[7A]	Maintenance action
128	[80]	Internal error
129	[81]	Originator time-out
130	[82]	Originator D_Xfer when Paknet Radio-Pad regs
131	[83]	No Paknet Radio-Pad with called NUA or CUG
132	[84]	No NACs available – no response
133	[85]	No sessions available
134	[86]	No ITP buffers available
135	[87]	Wrong event for current state
136	[88]	Invalid event
137-142	[89-8E]	Reserved for future allocation

Modem Setup Strings

This section is designed to show you how to check your current modem/X.28 setup string in PMAC, and how to create a new modem setup string from scratch.

A "Modem Set-up String" is a list of commands that PMAC and other communications programs use to tell the modem/X.28 Radio Pad how to behave. In order to understand how to create a modem setup string, you need two things.

Firstly you need to know how PMAC expects its modems to behave, and secondly you need to know all of the setup commands for your modem or X.28 PAD. The setup commands are usually supplied with the modem or X.28 PAD either in a text file on disk, or printed in the manual. Before creating a new setup string for a device, details of the modem / X.28 setup commands should be found.

Checking your Current Modem Setup String

Enter System Manager mode; from the **PMAC Main** window, select the EDIT menu and COMMUNICATION PORTS - the **PMAC Communication Settings (SYSTEM)** window is displayed (right).

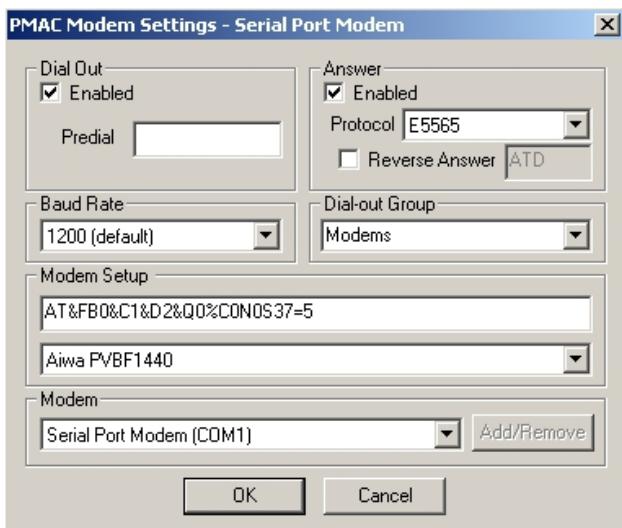
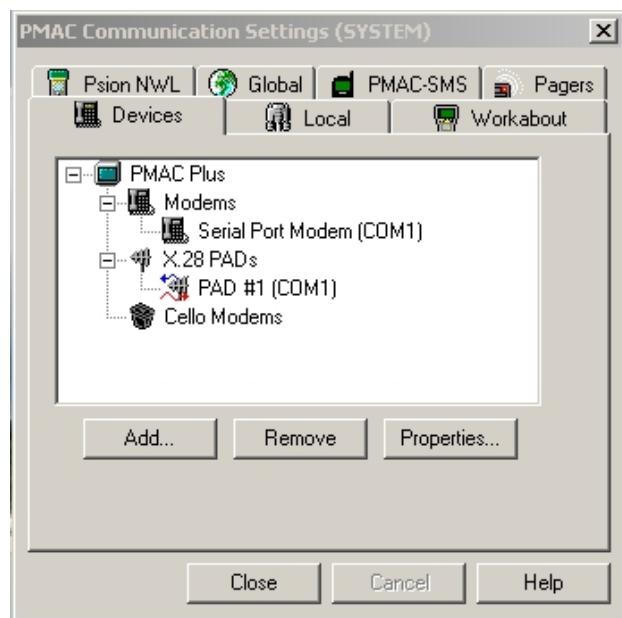
In this window, you should see your PMAC modems and X.28 PAD's listed (in our example, the modem is called 'Serial port modem, and the X.28 PAD is called 'Pad #1').

To check the modem or PAD settings, simply double left-click on the modem or PAD name in the list. You will then get the window shown below right.

This window shows the port and modem settings for the device - in this example, a modem.

You will notice that the Modem Setup String is selected as one of the pre-set strings (currently the US Robotics Sportster setup string). There are a number of pre-set setup strings for many of the popular modems on the market today.

The string of characters and numbers is the Modem Setup String. Currently this is "AT&F1X3&K0&M0". To decode the setup string, one will need to look at the modem manual for the US Robotics Sportster.



Decoding a Modem Setup String

This is a simple task once the pattern of modem strings is clear to you. We will take the previous example of the US Robotics Sportster modem setup string, and decipher its meaning using the modem manual. Here is a golden rule to modem setup strings:

“Modem commands consist of a letter (often with a prefix such as &, % or +) and optional suffix modifiers”

The best way of explaining this is with an example. Here is an example modem setup string:

“AT&F1X3+MS=1200,9600,0,1S0=0Y0&W0”

Modem set-up strings always start with an ‘AT’ for PC Hayes (AT) compatible modems, and then a list of modem commands. This setup string is just about as complex as they come. Some of the commands are easy to pick-out from the string:

&F1, X3, &W0, Y0, S0=0

Using the modem manual, it is then easy to decipher these meanings. The modem manual will have the commands themselves, and then it will tell you what they mean and what the modifiers mean. The commands (in the ‘raw’) are:

&F, X, &W, Y, S

The other numbers and ‘=’ signs were just modifiers to those commands.

The last command in our setup string is:

+MS=1200,9600,0,1

This is special because it uses two characters to denote the command. You will always get a ‘+’ at the start of commands with two or more characters, so they are easy to spot. The command here is:

+MS

The rest of the command is just the modifier. You will have to look in the modem manual to see the effect of these modifiers on this command.

Now we know how to decode a modem setup string, lets try with the US Robotics Sportster setup string in PMAC. Here is the string:

AT&F1X3&K0&M0

First, let’s take off the ‘AT’ at the start, and identify the commands themselves. Here’s the string split-up into its constituent commands:

&F1, X3, &K0, &M0

The ‘raw’ commands without their modifiers are:

&F, X, &K, &M

We can now look in the modem manual to find the meanings of these commands. Here are the commands listed with their meanings:

&F = Loads a factory default configuration (&F1 = Hardware flow control default)

X = Sets result codes displayed (X3 = all results except dial-tone detection)

&K = enables / disables data compression (&K0 = disable compression)

&M = sets error control (ARQ) (&M0 = disable data compression)

We now have the meaning of the Sportster modem setup string!

PMAC's Expected Modem Behaviour

PMAC expects the modems to which it's connected to operate in specific ways when it is talking to them. The loggers that the modems connect to, also expect the PC modems to act in a special way to allow for quick connections and minimal battery usage during data transfer. All of these different demands mean that the PC modem needs to be setup properly for PMAC in order to assure wide compatibility with loggers and PMAC itself. This is a list of the items that should be setup on a PC modem to allow it to talk to PMAC properly, and have the greatest compatibility with logger modems.

- Modem result codes should be enabled (Quiet mode OFF - usually 'Q0').
- Modem commands should be echoed from the modem (Local echo ON – usually 'E1').
- Modem result codes should be in text form (Verbal results ON – usually 'V1').
- As many result codes as possible should be activated (usually 'X3' or 'X4').
- Modem should detect dial tone and wait for an answer (usually also 'X' command).
- Error control result codes should be disabled.
- Error control should be disabled.
- Compression should be disabled (usually '&K0').
- Modem Serial-port rate should be fixed (does not follow connection speed).
- Carrier-Detect should be enabled (usually '&C1').
- Software flow-control should be disabled (Usually '&I0').
- Hardware flow-control should be disabled (Usually '&H0').
- DTR should be enabled so the modem disconnects when DTR is 'dropped' (usually '&D2').
- If possible, fix the modem's connection speed to the speed of the loggers you're connecting to (normally 1200bps, but GSM loggers are 9600bps) (may be '+MS' or '&N').

Creating a New Modem Setup String

You now have all of the skills needed to produce a workable setup string for your modem. You know what things are needed in order to get good PMAC and logger compatibility (earlier in this section), and if you have your modem manual then you have all of the information on the modem commands needed.

Creating a new modem setup string is simply a matter of finding the command to do each of the setup items on the previous page, and adding them to the setup string. Once you have your new setup string, you can remove those items that are set by default in the modem (at lot will be), and add 'AT' to the start of the string.

Here is a example using the US Robotics Sportster modem:

1. after checking the modem manual against the items needed on the previous page (we don't need to talk to GSM modems), the setup string is:

Q0E1V1X3A0&M0&K0&B1&C1&I0&H0&N2

2. Now we remove those items that the modem will already do by default, and we have:

X3&M0&K0&C1&H0&N2

3. Now we add 'AT' to the start, and we have a usable PMAC modem setup string (as long as we don't want to do GSM communications):

ATX3&M0&K0&C1&H0&N2

And that's all there is to it, usually.

You may well find that you are trying to use a 'strange' modem with PMAC. There are a lot of good modems on the market that need considerable extra setup to get them to work with PMAC. In the event that you have a modem that does not work with PMAC, you should have your modem manual handy and then give the Technolog Support Desk a call (number on front cover).

Appendix A Glossary of Terms

The following terms and expressions are included, with their implications, to assist in understanding the manual and software.

Bitmaps	A bitmap is a screen image used to represent an area or district. Bitmaps are entirely user-definable and may represent a pipe network, town outline or a simple list of site names.
CDPD	Cellular Digital Packet Data – is a communications network used primarily in North and South America. It uses existing cellular networks for data transmission, between the normal cell phone conversations.
Channel Rate	Refer to Rate.
Control Group	A group of loggers configured within the Control Database to perform pressure control.
CSV	Comma Separated Values. A file format where numeric data is stored in a text form with fields separated by commas; suitable for importing to most spreadsheets.
Disk	Generic term referring to any diskette or hard disk.
Diskette	Removable floppy disks (3½" or 5¼")
Download	Retrieve data via a communications link, either locally or remotely.
Dragons	Software program which runs on a Psion Workabout. It enables the data from several loggers to be uploaded to the Psion (on site) and subsequently transferred from the Workabout to a PC running PMAC. Dragons stands for Data Retrieval And Graphics ON Site .
Field	A subsection of a database record.
GPS Protocol ID	(Also known as Remote ID) - Second ID given to GPS protocol loggers to allow PMAC Plus to differentiate between two or more loggers connected to the same modem (e.g. Dialog 377 – up to eight loggers).
Greyed-out	This is when a menu item appears faint and cannot be selected. It allows you to see where the item appears in the menu, but the option is not available for an operational reason.
Hard disk	A non-removable disk.
Hayes Commands	Standard 'AT' command-set used by most PC modems. This command set is just a 'de facto' standard, and different modem manufacturers have their own interpretation of it, with many less-used commands having differing effects/results. This means that it is very important to retain the manual provided with YOUR modem(s).
Modem	An interface-unit for connecting a PC to a telephone line to allow remote communications.
Notepad	A general purpose area of memory within a logger used for storing calibration details and application specific or user-defined information.
PAD	Packet Assembler, Disassembler – or Radio PAD.

PMAC ID	ID given to loggers to allow PMAC Plus to reference all logger data. This ID is also used as simple security in the E5565 protocol.
Polling	Automatic site scan; the operation of systematically contacting a set of loggers to retrieve data.
PSTN	Public Switched Telephone Network, the standard telephone communications system.
Rate	The time between samples being taken.
Record	An entry in a database consisting of one or more fields.
Remote ID	(Also known as GPS Protocol ID) - Second ID given to GPS protocol loggers to allow PMAC Plus to differentiate between two or more loggers connected to the same modem (e.g. Dialog 377 – up to eight loggers).
Root directory	The lowest directory level. An operator may move directly to the root directory (or simply 'root') CD \ may be typed.
Rotating Store	System for storing the most recent information. When the memory becomes full, the oldest data is removed and new data stored in the vacated area.
Store-till-Full	Memory allocation system where data is logged until the memory is exhausted; whereupon the logger stops logging and reverts to a standby condition.
Timebase	Applicable to Technolog protocol loggers only - This is the 'heartbeat' of the logging process. At each timebase interval, the logger examines its configuration and decides if a channel requires a log to be taken and acts accordingly. Using a common timebase, channels may have different logging rates. The timebase may not be changed if the Newlog is logging. Refer to Rate.
Time Resolution	Applicable to Technolog protocol loggers only - The time resolution is the accuracy to which an event may be recorded. Newlog may be set to have a time resolution of 10 seconds or 1 second. When operating in the 10-second mode, a 'header' is stored in the memory at each midnight; during the 1-second mode a header is stored every 4 hours.
Logging interval	Refer to Rate.
On-Time	Applicable to Technolog protocol loggers only - The length of time that a control output is in the low (or on) state prior to a reading being taken on any associated channels.
X.25	Communications protocol used by X.28 PADs to talk to each other by radio.
X.28	Communications protocol for communicating locally to a Radio PAD through a serial cable.
Zero offset	Applicable to Technolog protocol loggers only - The input value which corresponds to a zero reading. For example a pressure transmitter may output 4-20 mA, representing 0 to full scale pressure, in this case the zero offset is 4 mA.